1940

Dairy Calf Club Manual : Extension Circular 6-01-2 1940

M. L. Flack

Extension Circular 6-01-2

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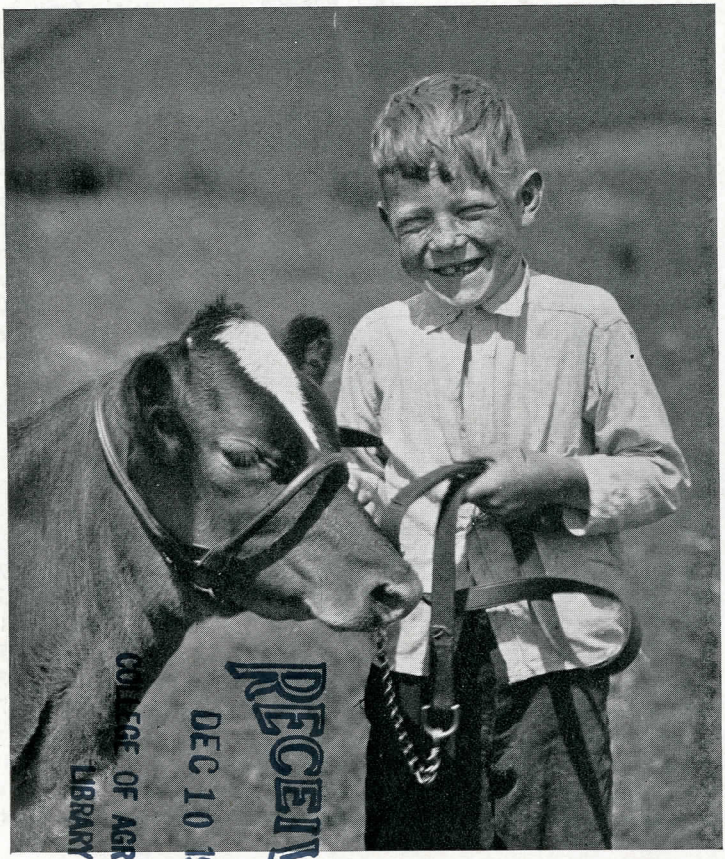

The University of Nebraska Agricultural College
Extension Service and the United States Department of Agriculture Cooperating
W. H. Brokaw, Director, Lincoln

The Dairy Industry and the 4-H Club

IF agriculture is to prosper in Nebraska, it will do so largely through its livestock. This livestock will need to be better than in the past because it is going to meet competition from livestock in our neighboring states.

The dairy cow has a very important part in Nebraska agriculture. She contributes around $33,000,000 annually to the farm income exclusive of the sale of surplus stock. From the standpoint of the individual farmer, dairying is an important factor in furnishing a year-round source of cash.

In addition the dairy cow is a source of an important share of the farm family food supply. However, there is evidence to indicate that the food value of high-quality dairy products is not fully appreciated. Many farm families can well afford to utilize more dairy products in their diets.

Good dairy herds can be built and maintained with a comparatively small original expenditure of money. A good example of this is one 4-H club boy who purchased a purebred dairy calf for $60 which, with another purchased later, was the foundation for one of the good herds in the state. He has a herd of twenty purebred cows whose average production in 1939 was 361 pounds of butterfat.

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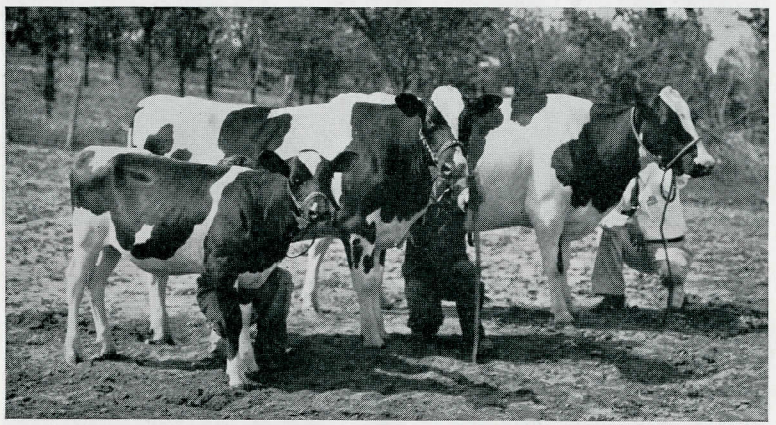
The illustrations of the Babcock test and the blanket have been copyrighted by HOARD'S DAIRYMAN and are printed here by permission. The cover photograph was obtained from the American Guernsey Cattle Club. The illustrations of steps in preparing and showing a heifer were obtained from the University of Nebraska Department of Visual Education. This is the third edition of the Nebraska 4-H Dairy Calf Club Manual. Previous editions were printed in 1931 and 1937.

Dairy Calf Club Manual

M. L. FLACK and M. N. LAWRITSON

NEBRASKA boys and girls enrolling in a 4-H dairy calf club project should have several things definitely in mind. First, the primary purpose should be to grow and develop dairy cattle of high-producing ability and superior type. Starting with a calf and growing out the heifer is only a part of the dairy enterprise. Second, 4-H dairy calf club members should plan a constructive breeding program based on the use of better sires, and a testing program in which production records are kept on all the cows in the herd. Third, club members should make every effort possible to get all they can out of the information and suggestions that are offered in the club lessons. Learning such things as feeding, judging, marketing of dairy products, and general dairy management is of much value to the future dairyman.



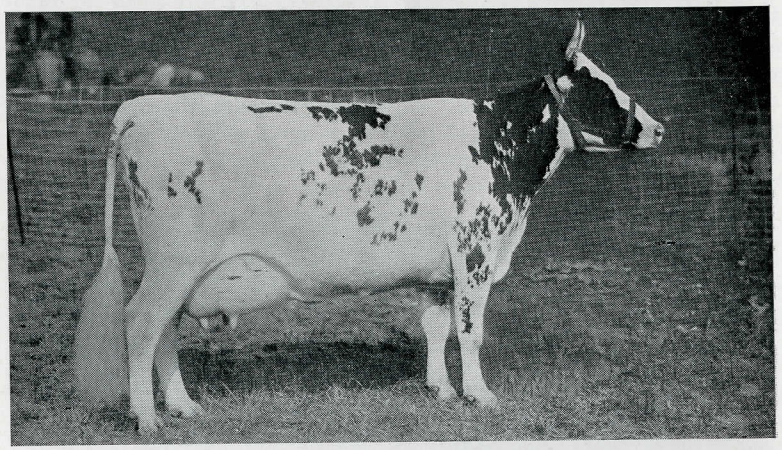
Herd Developed from One Cow by a Club Boy

This manual takes up a discussion of the breeds of dairy cattle, selection of the dairy heifer for the three year 4-H dairy project, care and management of the calf, heifer, and producing cow, the keeping of records, fitting and showing of the animal and making the Babcock test. In addition, this manual contains a brief outline of the 4-H Junior Dairy Bull Association, of which there are several in Nebraska. This manual is intended as a guide for Dairy Calf Club members throughout the three year project.

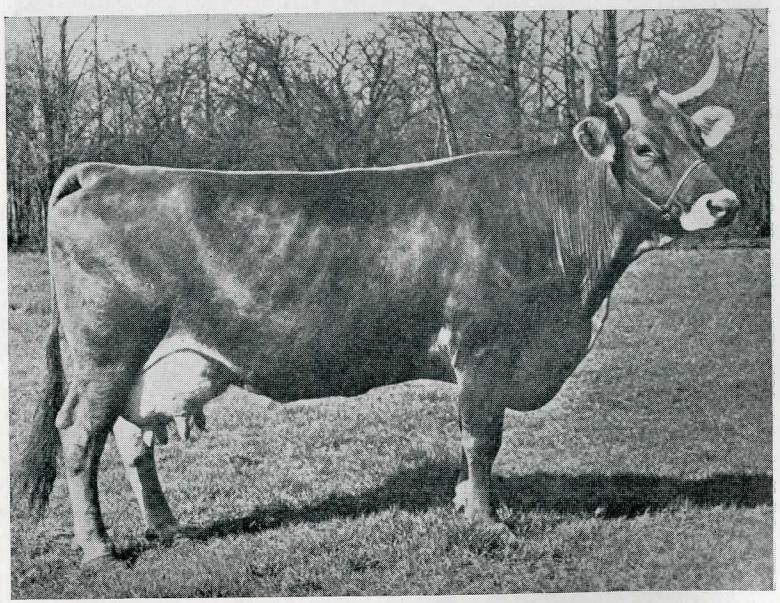
BREEDS OF DAIRY CATTLE

There are five major breeds of dairy cattle in the United States—namely, Ayrshire, Brown Swiss, Guernsey, Holstein-Friesian and Jersey. Other breeds such as Milking Shorthorns and Dutch Belted are not so widely distributed.

Ayrshire.—This breed originated in County Ayr, Scotland. It is a medium sized breed; cows weigh on the average 1100 pounds and bulls about 1600 pounds. Color of the Ayrshire may vary from a medium red to a very dark mahogany brown and white, with either of the colors predominating. Ayrshires are considered good rustlers. They are also noted for uniform, square, level udders with well placed teats. Their milk is of about the average richness of the dairy breeds.

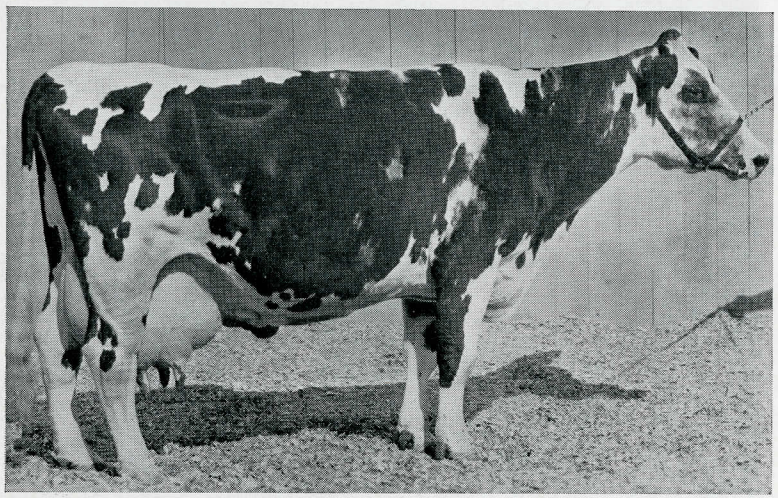


Good-type Ayrshire Cow



Good-type Brown Swiss Cow

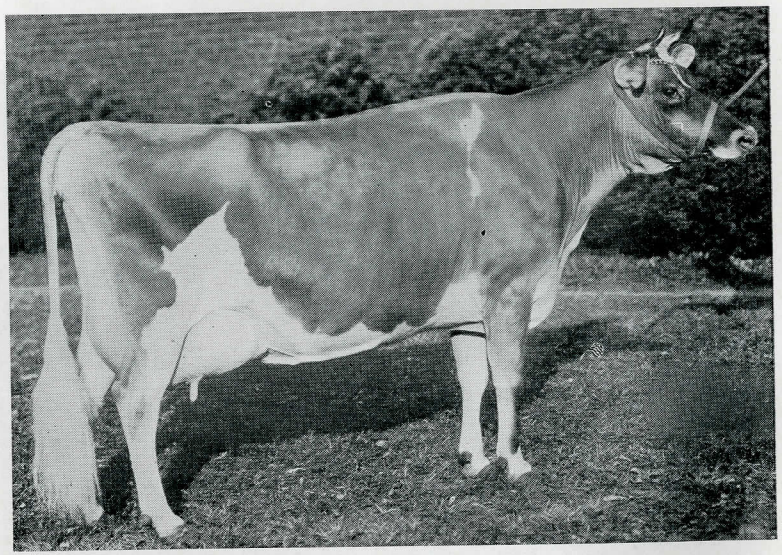
Good-type Guernsey Cow



Good-type Holstein-Friesian Cow

Brown Swiss.—While maintained primarily for dairy purposes, the Swiss cattle are claimed to be a dual purpose type. The original home of the Brown Swiss cattle was the canton of Schwyz in Switzerland, but the type is now bred in all the neighboring cantons of the Alpine region. The Brown Swiss was first introduced into America by Henry M. Clark of Belmont, Massachusetts, in 1869. These cattle have a rugged constitution, are very docile and respond well to good feeding. The preferred color is a medium brown or silver brown, with a light colored band around a dark nose. The cows weigh between 1200 and 1300 pounds and the bulls between 1700 and 1900 pounds. The cows of this breed produce a liberal amount of milk with an average test of 4 per cent.

Guernseys.—This breed finds its origin on the Isle of Guernsey, an island four miles wide and seven miles long lying in the English Channel between the coasts of England and France. The characteristic color is a shade of fawn and white, varying from almost red to a very light fawn. Light fawn with white markings is perhaps the most common. A buff nose and amber-colored horns of medium size are other characteristics of the breed. A rich yellow secretion of the skin is most highly thought of by breeders and is considered an indication of the quality of the milk which is highly colored and rich in fat. Cows weigh on the average 1100 pounds and bulls 1600 pounds.



Good-type Jersey Cow

Holstein-Friesian.—This is one of the largest of the dairy breeds; the cows weigh on the average 1350 pounds and bulls 2,000 pounds. This breed is universally black and white; however in Holland red and white animals may be registered. As a breed the Holsteins are the heaviest milk producers.

Jersey.—This breed originated on the island of Jersey. This island is about seven miles wide and fourteen miles long, and lies in the English Channel off the coast of France. The Jersey varies more in color than any other breed of dairy cattle. There are various shades of fawn, gray, mouse color, dark brown, and oyster white and fawn. The solid color is preferred by most breeders. The muzzles, as well as the switches, usually are black. The Jersey is the smallest of the dairy breeds but is noted for refinement, quality, and uniformity of type. As a breed it produces milk with the highest percentage of butterfat. Cows average 950 pounds and bulls 1450 pounds.

Chart Summary of Breeds

Breed	Native Home	Color	Standard wt. cows	Standard wt. bulls	Av. wt. calves	Fat tests
Ayrshire	Scotland	Red and white	1100	1600	70	4.0
Brown Swiss	Switzerland	Brown gray mouse color	1300	1900	90	4.0
Guernsey	Isle of Guernsey	Light to dark fawn with white markings	1100	1600	70	5.0
Holstein-Friesian	Holland	Black and white	1350	2000	90	3.5
Jersey	Isle of Jersey	Light to dark fawn with white markings	950	1450	50	5.4

CHOOSING A BREED

Before choosing a breed of dairy cattle, there are several things to consider.

First.—If one breed prevails and seems to be the most popular in the community, it would be best to choose this particular breed because it is much easier to buy and exchange sires and to sell surplus stock.

Second.—Personal preference is important because one is more likely to succeed if the undertaking is one of his own choosing.

Third.—The market for dairy products must be considered in choosing a dairy breed. Some cities and dairy manufacturing plants have certain requirements for butterfat and total solids in milk.

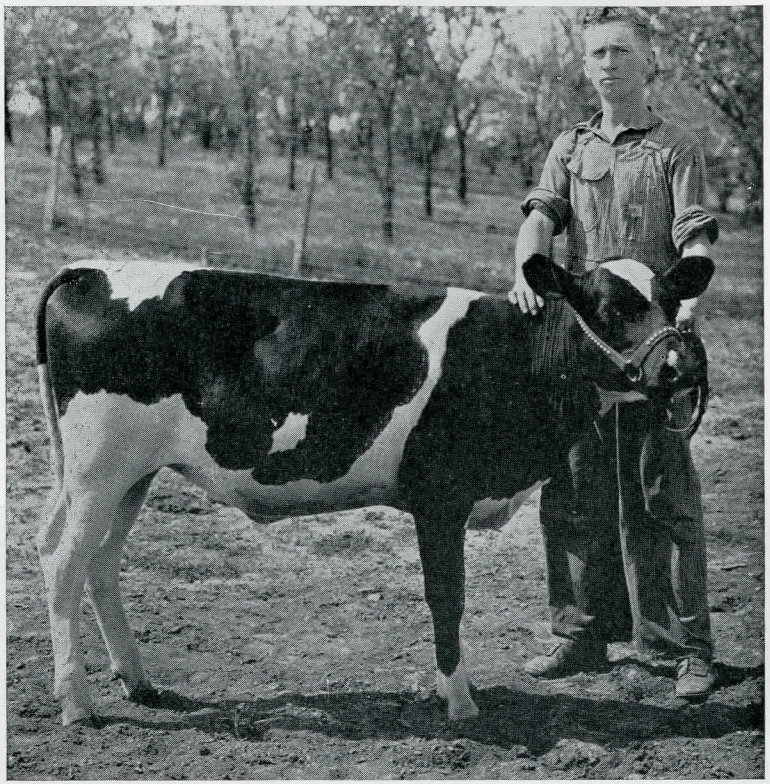
Fourth.—With the wide range of climatic conditions in the United States and the difference in topography, it is always desirable that the nature of the country and climate be considered in choosing a breed.

SELECTING THE CALF

It is not always possible to select a young calf that will develop into a cow of good type and profitable production. Even under the most favorable conditions and the most exacting care, mistakes in selecting often occur. In selecting a calf the following points should be considered.

Type.—The calf should have all the desirable characteristics of the breed it represents, such as head character, color, general conformation, a straight topline with a long, wide, level rump, wide at pin bones, tail head carried out straight and smooth.

Capacity.—The dairy calf, in order to be a good feeder and develop into a cow of good proportions, should show plenty of barrel capacity (that is, a wide spring of rib), a deep body, good width between the ribs, and length of body in proportion to the rest of the animal.



A Good-type Club Calf

Constitution.—A strong constitution is found more often in animals that have large, roomy middles. The heart girth should be large, as indicated by depth and width back of shoulders and width between front legs, thus giving plenty of room for the lungs and heart. Vigor and constitution are also indicated by strength of jaw and size and alertness of the eye.

Dairy character.—It often happens that a dairy calf or cow will have constitution and capacity along with a straight top line and level rump, yet she will not have that important characteristic which distinguishes her from

other breeds of cattle, which is "dairy character." Through many years of careful selection, breeders have developed the dairy cow to a point where she differs from beef breeds in conformation. The dairy cow is spare of form, free from fleshiness over the hips, pin bones and loin, thin and rather sharp over the shoulders, slender and slightly ewe necked with length of neck in proportion to the rest of the body. These characteristics should be rather pronounced even in a young dairy animal.

Mammary development.—The development of the udder should be quite prominent, even in young heifers. The teats should be well apart and evenly placed. The rear attachment of the udder should be high and wide. The milk wells and veins should also show good development.

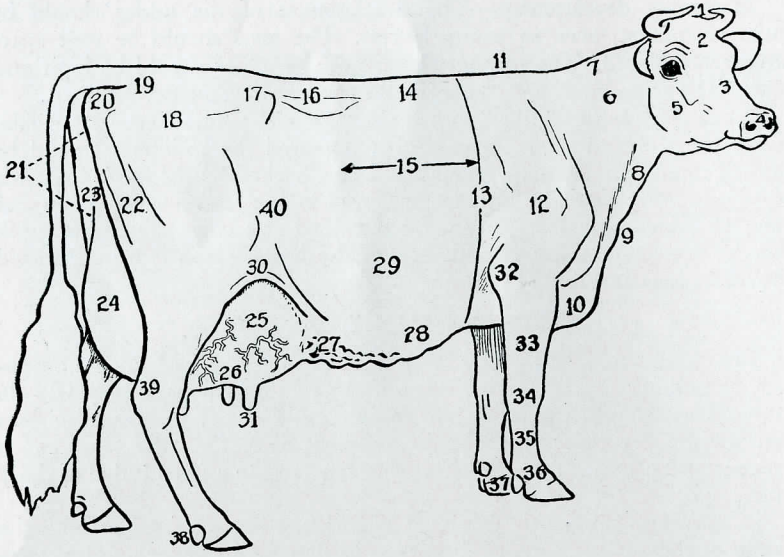
"Like tends to beget like," so it is always a wise plan, whenever possible, to see the sire and dam. In case of a purebred the pedigrees should be studied carefully. The dam should be a cow backed by production records of at least 300 pounds of butterfat produced in one lactation period. Avoid cows of exceedingly low percent fat tests and also cows with small milk flow. The average test and milk flow of the breed which is being selected should be kept in mind.

JUDGING DAIRY CATTLE

4-H club members as young stock raisers can well afford to take advantage of judging practice. This work if done in a systematic way will do more toward developing intelligent thinking and ability to make decisions than almost any other type of agricultural work. It usually takes much patience and constant practice before one can become a good judge of dairy cattle.

In learning to judge the beginner should first become familiar with the names of the various parts of a dairy animal as well as terms and phrases used in comparing them, one with another. The best way to get the desired information is by the use of the score card and charts furnished by the Agricultural Extension Service, University of Nebraska. The chart on page 10 gives the points of a dairy cow along with their location. On page 11 the reader will find a score card for beginners.

Most decisions in placing dairy cattle are made by what you see. When in the judging ring with cows you should first view them from the side at a reasonable distance rather than close up for general appearance, depth of body, straightness of top line, length and levelness of rump, shape of udder, and heart girth. A rear view of the animal shows you the spring of rib, width of loin, width between pin-bones, spareness over the shoulders and back bone, rear udder attachment, and teat placement. Look along the cows' underline for veining, fore udder attachment, and teat placement. The udder of the dairy cow is of considerable importance because this is where the milk is manufactured. It should be of such shape and texture as to give the best continued service for the greatest number of years. Watch especially for light quarters, strength of udder attachments, capacity, and quality.



Parts of a Dairy Animal

1. Poll
2. Forehead
3. Face
4. Nostril
5. Jaw
6. Neck
7. Crest of neck
8. Throat
9. Dewlap
10. Brisket
11. Withers
12. Shoulder
13. Heartgirth
14. Back
15. Ribs
16. Loin
17. Hip bone
18. Thurls
19. Tail setting
20. Pin-bones
21. Escutcheon
22. Thigh
23. Rear attachment of udder
24. Rear udder
25. Fore udder
26. Width between teats
27. Milk veins
28. Milk wells
29. Barrel
30. Flank
31. Teats
32. Elbow
33. Forearm
34. Knee
35. Shank
36. Ankle
37. Hoof
38. Fetlock
39. Hock
40. Stifle

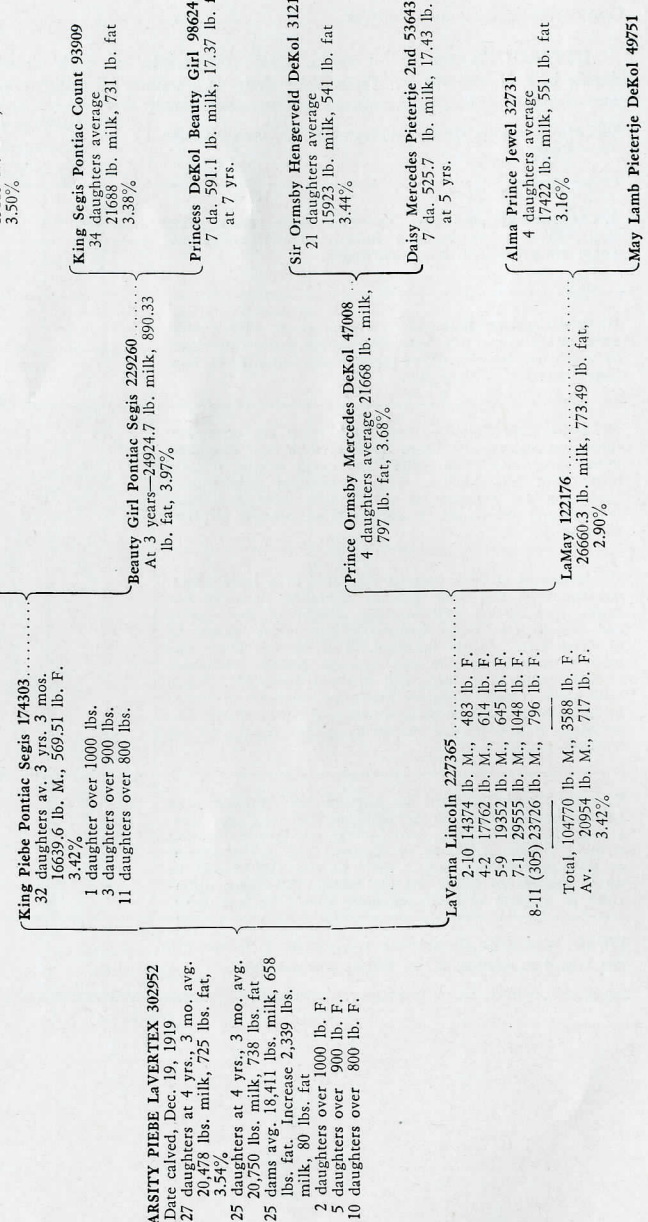
Dairy Cattle Score Card

Contestant's Name or Number ..... Class .....

INSTRUCTIONS: First make your comparison of each animal as indicated by details in I, II, III, IV, V. Then place them as a whole, all things considered.

DETAIL COMPARISONS—Emphasizing the more important evidence of:	JUDGE'S AND CONTESTANT'S PLACING (Contestants use upper line)					
	1st	2nd	3rd	4th	5th	6th
I. Constitution: Indicated by deep wide chest; large heart girth; width between forelegs; nostrils large and open; eye prominent, large and bright.						
II. Feed Capacity: Indicated by a long, deep, wide middle; great spring of rear rib; wide loin; length partly determined by width between ribs. Feed capacity also indicated by large broad muzzle and deep jaw.						
III. Dairy Character: Indicated by a clean cut open conformation and angular form. Lack of flesh over shoulders, loins, rump and thigh. Slim ewe neck; quality of skin being thin and pliable. (Dry cows and heifers near freshening are expected to carry more flesh than those in milk and should not be criticized too strongly on dairy character.)						
IV. Mammary or Milk System: Indicated by a large udder, attached high and wide behind, extending down to fair depth, and carried well forward. Udder of fine quality and texture free from fleshiness. The udder should be of good form, evenly balanced, level on the floor, and teats of a uniform size and squarely placed. Mammary or milk veins long, large and tortuous (crooked). Large milk wells. (**Bulls:** Consider masculine character as shown by boldness of head, prominent crest on neck, strong constitution, well developed rudimentaries (or teats) that are squarely placed.)						
V. Breed Type: Indicated by a clean cut feminine head (masculine in bulls). A straight top line; a strong loin, a long wide level rump, wide at the pin bones. Pleasing style of animal as shown by alertness and a symmetrical or well proportioned body. Scale or size that should be up to average or larger for the breed. The breed differences as to form of head and color should be considered.						
FINAL PLACING: Considering animals as a whole with due regard to relative merits, defects and soundness.						

A Good Pedigree



HOW TO GIVE REASONS

In order to determine the best judges in various dairy judging contests the 4-H club members are required to give oral reasons. Where four animals are in a class, oral reasons should be given in about the following manner:

I place this class of Brown Swiss cows A-D-B-C. I place A over D. A is the outstanding cow in the class and she should be placed first. She excells D in capacity of udder, which is especially fuller in the fore quarters and is much higher and wider in the rear attachment. A's milk veins are larger and longer than D's. A is straighter on the top line and much smoother over the tail setting. She shows more refinement in the thighs and over the withers. A is a deeper cow than D. I will have to admit, however, that D has advantage in refinement in head, neck, and throat and further shows more breed character.

I place D over B, considering this a close placing. D has the advantage over B because she is deeper, and wider in the barrel. She also has a greater heart girth and is much wider at the floor of the chest. B is especially faulty in this respect. Further, D is more nearly level in the rump than B and stronger and straighter in the back. I admit that B excells D in the fore attachment of udder and has more uniformly placed teats.

I place B over C. B is much superior to C in udder development. Her fore udder is more fully developed, extends further forward, and the teats are placed more squarely on the udder. The halves of the udder are more nearly balanced and the rear attachment is much higher and wider. C's udder is very faulty in that is it badly cleft and tends to be pendulous. B is slightly deeper in the chest, cleaner and more refined in the throat and the head. I admit that C has an advantage over B in her straighter top line and more level rump. These are my reasons for placing this class of Brown Swiss cows A-D-B-C.

In giving reasons the contestant should be careful to avoid form sets of reasons. Be sure to state facts and never give imaginary differences that do not exist. Animals should always be compared and only the greater differences explained. Compare the animals, do not describe.

PEDIGREES

A pedigree is a diagram of the ancestry of an animal by generations, showing their relationships, and should contain records of production and show ring winnings. The male line always appears at the top of the bracket, the female line at the bottom.

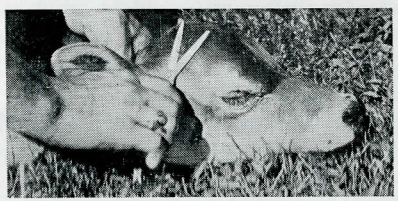
In studying a pedigree, the immediate ancestors appearing in the second and third generations should be given the most consideration. Too often animals are bought because there is a famous animal or a high record somewhere back in the pedigree, possibly as far back as the fourth and fifth generations. It is essential to have the production records appear in the second and third generations.

CARE OF THE CALF

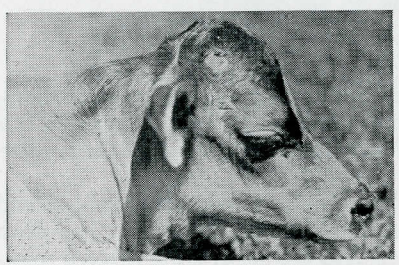
Start right.—A good start is half the battle in raising a dairy calf. A very important step in getting that start is for the calf to be born under absolutely clean, sanitary surroundings. A small isolated pasture makes an ideal birthplace for the calf at that particular season of the year. However, all calves are not born on nice warm, sunshiny, summer days. Therefore it is necessary to have a well bedded, clean, box stall for the birthplace. The stall should first be carefully prepared and disinfected so there is no chance for navel infection or scour infection.

The first feed of the calf must come from the mother. The colostrum, a thick yellowish milk that comes from the cow after freshening, contains certain substances that are absolutely essential for the new-born calf. This milk has a distinctive laxative effect that normal milk does not have. It also has a bug-killing quality and when it gets into the stomach ahead of a bit of dirt or hair or other foreign materials, digestive disturbances are warded off.

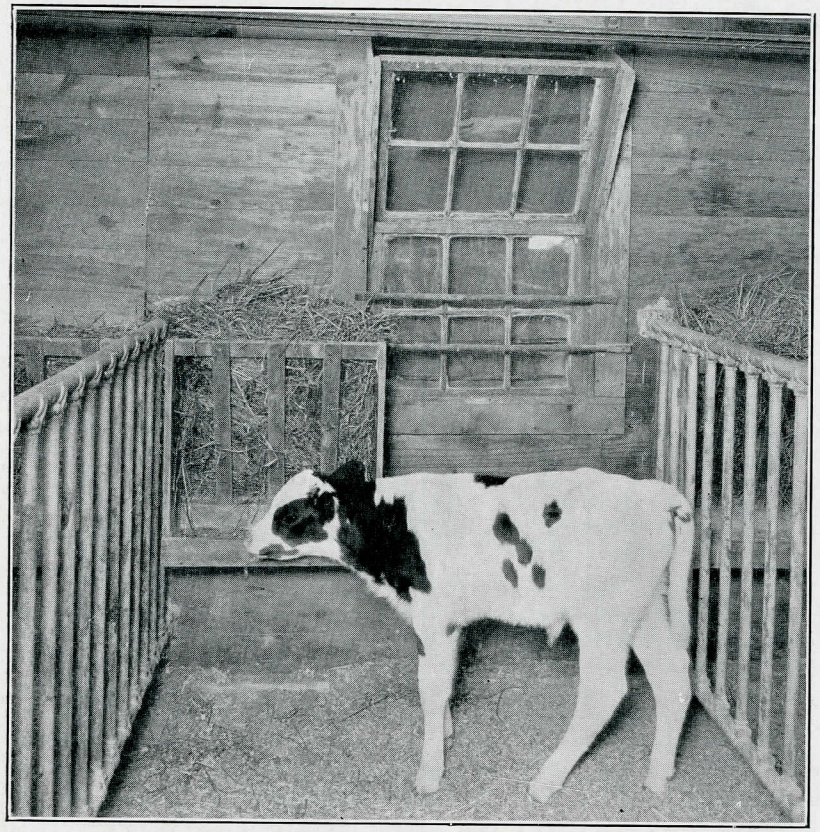
Teaching the calf to drink.—Often it is difficult to teach calves to drink unless they are hungry. For this reason it is always best to allow the calf to go without feeding for at least twelve hours after separating it from the cow. The usual method employed in teaching a calf to drink is to back the calf into a corner and stand straddle of its neck, the feeder facing the same way as the calf. The feeder then wets his two fore fingers and places them in the calf's mouth. While the calf sucks the fingers of one hand, he takes his free hand and pushes the calf's nose down to the milk. In many cases it takes considerable patience to get the calf started. When the calf starts to suck and thus draw the milk, the fingers should be slowly withdrawn from the mouth. In case the calf takes its head out of the pail after the fingers are withdrawn, the operation should be repeated. Never attempt to force the calf to drink by holding its nose deep in the milk for a long time. If this is done, the calf cannot breathe. When attempting to breathe it takes the milk into the lungs, often causing death or injury.



First Step: Clip Hair Around Button



Caustic Will Leave a Scar



Clean, Well Lighted, Well Ventilated

Dehorning.—Many breeders prefer polled cattle and in order to have them polled, dehorn the calves when they are very young. The easiest and most humane way is to apply caustic potash or some commercial preparation to the horn when the calf is a few days old. First remove the hair over the horn, which is at this time only a small lump or button under the skin. Moisten the caustic stick and rub on the button or apply the commercial preparation. One application is all that is necessary; however, a second treatment may be required if the first operation has not been carefully done. Much care must be used in applying caustic potash since it has a very irritating effect on the skin. The operator must be very careful not to get any on his hands or on the other parts of the calf's head or face. It burns very severely and will often leave a bad scar. It is best to have a helper while dehorning calves by the above method.

Milk Feeding by Weeks

Breed of calf	1st week	2nd week	3rd week	4th week	5th week	6th week	7th week	8th week	9th week and thereafter
	Whole milk daily	Whole milk daily	Whole milk daily	Whole and skim milk daily	Skim milk daily	Skim milk daily	Skim milk daily	Skim milk daily	Skim milk daily
	Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*
Guernsey	6	6	8	10	12	14	16	18	20
Jersey	6	6	8	10	12	14	16	18	20
Ayrshire	8	8	10	12	14	16	18	20	20
Brown Swiss	10	10	12	14	16	18	20	20	20
Holstein	10	10	12	14	16	18	20	20	20

(From Uni. Nebr. Extension Circular 622.)

Change from Whole to Skim Milk

Time of feeding	1st day Monday		2nd day Tuesday		3rd day Wednesday		4th day Thursday		5th day Friday		6th day Saturday		7th day Sunday	
	Whole milk	Skim milk	Whole milk	Skim milk	Whole milk	Skim milk	Whole milk	Skim milk	Whole milk	Skim milk	Whole milk	Skim milk	Whole milk	Skim milk
	Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*
A. M.	7	0	6	1	5	2	4	3	3	4	2	5	1	6
P. M.	6	1	5	2	4	3	3	4	2	5	1	6	0	7

(From Uni. Nebr. Extension Circular 622.)

Cleanliness.—Success in dairying depends in a large measure on cleanliness. This is not only true in raising the calf but is equally true in handling the mature herd. It is much easier to prevent disease than it is to cure it. Livestock sanitation, after all, is quite simple and for the most part is quite easy, inasmuch as most of the factors which cause the animal to thrive well and be productive are also the ones which tend to preserve its health. As far as the calf is concerned, cleanliness can be discussed under three heads.

Pen.—The pen should be clean, well lighted and have good ventilation. Drafts and cold, damp quarters should be avoided. Conditions of this kind cause colds and pneumonia. The bedding should be changed often enough to insure a clean, dry pen at all times. It is a good practice to disinfect the stall before putting the calf in it.

Utensils.—Feeding utensils such as buckets, feed boxes, and mangers should be free from dirt and filth. Filthy utensils are a frequent cause of indigestion and scours. Feeding pails should be washed and scalded after each feeding. Mangers or other parts of the stall that become dirty as a result of spoiled feed, should likewise be cleaned frequently. A few minutes each day spent in cleaning up the calf quarters and feeding utensils will be time well spent because many losses can be attributed to filthy utensils.

Feeds.—Milk that is sour or grain and hay that are moldy and unfit for young calves should be avoided. They, like filth, cause digestive troubles and losses to the dairymen. Only milk and feed that are known to be clean should be fed.

How much to feed.—The better you feed and care for your calf, the greater are her chances of developing into an animal that you will be proud to own when she grows up. It is best to feed young calves three times a day as more milk can be fed with much less chance of injury than where the calf is fed twice daily. Whether the calf is fed twice or three times daily, the following details should be observed. It is best to feed the mother's warm milk to the calf for a day or two. The temperature of the milk is important and it should be kept near the temperature of the animal's body. Avoid milk that is too hot or milk that is too cold. Milk of this kind is likely to cause digestive disorders. From two or three pounds of milk at a feeding, depending on size and strength of the calf, will be ample for the first few days. The amount fed is usually determined by the weight, breed and physical condition of the calf. A general rule that is sometimes followed is to feed Jerseys and Guernseys one pound of milk per day for each ten pounds of live weight at the start. Larger breeds such as Holsteins and Brown Swiss need about one pound of milk for each eight pounds of live weight. The calf-feeding schedule on the opposite page is a good one to use the first six months.

Feed regularly and not too much.—The best dairymen and stockmen are regular in their feeding work. Effects of irregularity in feeding are very evident in many poorly managed dairy herds. Decrease in production, as well as thin, rough looking animals, can be attributed partly to irregular feeding. A large percentage of our death loss in calves can be traced to overfeeding. This is because the young calf in many cases cannot digest all the feed it consumes. Its digestive tract becomes irritated and infected. Then we have a sick and often stunted calf. Some precautions are neces-

sary in raising calves: first, do not overfeed; second, feed regularly; third, weigh or measure feed; fourth, make changes gradually; and fifth, keep all feeding utensils clean.

From whole to skim milk.—Calf raising is made easy when there is plenty of skim milk available. It is a very satisfactory substitute for whole milk. It is whole milk with the butterfat removed. The change from whole to skim milk should be very gradual. One pound of skim milk should replace one pound of the whole milk daily. In other words, remove one pound of the whole milk and add one pound of the skim milk daily until all the whole milk has been taken away. In making the change, be sure the skim milk is warm, or near body temperature. The froth on separated milk should be removed as it often causes bloat.

Skim milk is a very valuable feed for a calf and can be used to good advantage until the calf is six months old. In case skim milk is not available, some of the commercial calf meals can be used. Directions should be followed very closely in using them. It is well to keep in mind that there is really no substitute for milk. Skim milk and a home mixed grain ration will usually give more satisfactory results at less cost than will calf meal.

Grain mixtures.—A grain mixture is cheaper than whole milk, and should be used to supplement the skim milk and take the place of the fat taken out of the milk. Calves should be taught to eat grain early in life. A small amount put in a box in their stall or in a bucket where they can have access to it often gets them started to eat small quantities of grain at two to three weeks of age. A little of the grain mixture placed in the calf's mouth will give her the taste for the grain and get her started to eat earlier.

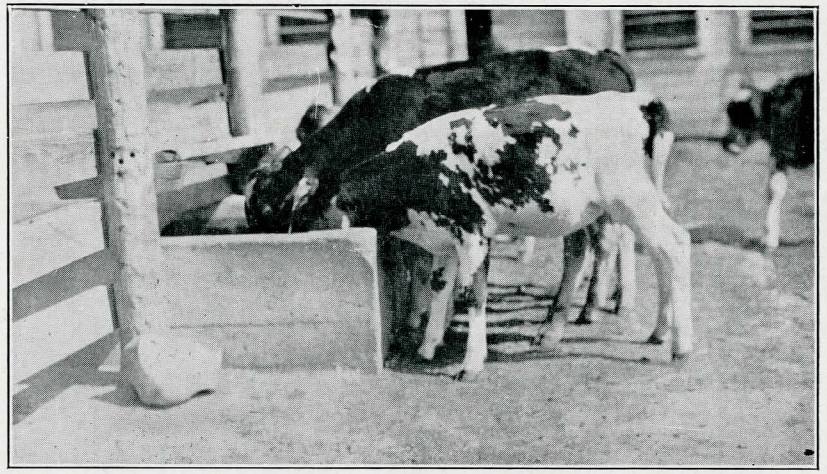
A good grain ration for calves and one often used, is equal parts by weight of ground corn, ground oats, and wheat bran. Other mixtures are often fed. The following is a list of the most common:

1	2	3
1 part cracked corn	2 parts cracked corn	5 parts cracked corn
1 part whole oats	1 part ground oats	2 parts ground oats
	1 part wheat bran	2 parts wheat bran
		1 part linseed oil meal

Calves under four months of age will not overeat, but older calves should be limited in amount of grain fed. The amounts fed should be governed by the condition of the heifer. She should be fed enough grain to keep her in good growing condition. Avoid getting the heifer kept for breeding purposes too fat. A rule that is sometimes followed is to feed one-fourth to one-half pound of grain per day for each hundred pounds live weight. Of course this depends on the condition of the heifer.

Roughage.—The calf will begin to eat hay at about two or three weeks of age. Mixed hay is preferable to alfalfa for the first six or eight weeks. Prairie, timothy, blue grass and other hays that are of a fine texture and good quality are best. Alfalfa is frequently used but sometimes with the very young calf it causes scours. For the older heifer, alfalfa can be used exclusively with good results. All calf pens or stalls should be equipped with a slatted rack that prevents waste and holds a sufficient amount of hay to insure a constant supply.

Silage.—Silage is an excellent feed for a growing heifer over three months old. It adds bulk and succulence to the ration. Silage should be fed in small quanties to the young heifer. It is not best to substitute silage for all the hay as it will probably not supply enough food for maximum growth. Silage should be fresh from the silo, of good quality, and free from mold.



Fresh, Clean Water is Essential

Water and salt.—In addition to grain and hay, water and salt must be supplied, since both serve as a tonic as well as having food value. A growing heifer should have access to salt. Have a supply of fresh, clean water available at all times. Regardless of the amount of milk fed, the heifer should have water. In extremely cold weather, the water should be warmed, thus insuring a larger consumption, which is desirable.

Exercise.—The heifer should be given a lot or pasture in which to exercise both in summer and winter. Both exercise and sunlight help to insure normal growth and good health. (For more detailed information on feeding and care of the dairy calf, see Uni. Nebr. Extension Circular 622.)

Feed Requirements for Normal Growth of Dairy Heifers—Milk, Grain, Hay [1]

Age of calf	Ayrshire—Shorthorn				Holstein—Brown Swiss				Guernsey				Jersey			
	Whole milk	Skim milk	Grain	Good hay equiv-alent	Whole milk	Skim milk	Grain	Good hay equiv-alent	Whole milk	Skim milk	Grain	Good hay equiv-alent	Whole milk	Skim milk	Grain	Good hay equiv-alent
	Lb.	*Lb.*	*Lb*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*
1st week	7	..	...	...	8	..	...	...	6	..	...	...	5	..	...	...
2nd week	8	..	...	...	9	..	...	...	7	..	...	...	6	..	...	...
3rd week	9	..	0.1	0.1	10	..	0.2	0.1	8	..	0.1	0.1	7	..	0.1	0.1
4th week	5	5	0.2	0.2	5	6	0.5	0.3	5	4	0.2	0.2	4	4	0.2	0.2
5th week	.	11	0.5	0.4	..	12	0.8	0.5	.	10	0.5	0.3	.	9	0.4	0.3
6th week	.	12	0.8	0.6	..	13	1.0	0.7	.	11	0.8	0.4	.	10	0.5	0.4
7th week	.	13	1.0	0.8	..	14	1.5	1.0	.	13	1.0	0.6	.	12	0.8	0.6
8th week	.	13	1.0	0.8	..	14	1.5	1.0	.	13	1.0	0.6	.	12	0.8	0.6
3rd month	.	13	1.5	1.5	..	14	2.0	2.0	.	13	1.5	1.2	.	12	1.2	1.2
4th month	.	13	2.0	3.0	..	14	2.5	3.5	.	13	2.0	2.5	.	12	1.8	2.5
5th month	.	13	2.5	4.0	..	14	3.0	4.5	.	13	2.5	3.5	.	12	2.5	3.5
6th month	.	13	3.0	5.0	..	14	3.0	5.5	.	13	3.0	4.5	.	12	3.0	4.5
7th month	.	..	3.0	7.2	..	..	3.0	9.6	.	..	3.0	6.9	.	..	3.0	6.8
8th month	.	..	3.0	7.8	..	..	3.0	10.5	.	..	3.0	7.6	.	..	3.0	7.4
9th month	.	..	3.0	8.6	..	..	3.0	11.3	.	..	3.0	8.4	.	..	3.0	8.0
10th month	.	..	3.0	9.4	..	..	3.0	11.9	.	..	3.0	9.1	.	..	3.0	8.6
11th month	.	..	3.0	9.9	..	..	3.0	12.5	.	..	3.0	9.7	.	..	3.0	9.0
12th month	.	..	3.0	10.5	..	..	3.0	13.1	.	..	3.0	10.1	.	..	3.0	9.4
Total, birth to 6 months	189	2063	305	434	224	2191	367	504	182	2008	305	376	154	1853	284	376
6 months to 12 months	...	....	547	1621	...	....	547	2081	...	....	547	1572	...	....	547	1493
Total, birth to 12 months	189	2063	852	2055	224	2191	914	2585	182	2008	852	1948	154	1853	831	1869

[1] Modified from chart appearing in Food and Life—Yearbook of U. S. Dept. of Agri., 1939.

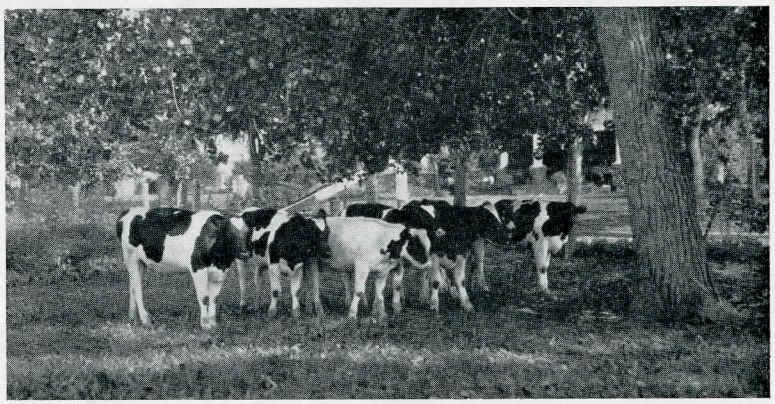
Feed Requirements for Normal Growth of Dairy Heifers—Milk, Grain, Hay [1] (Continued)

Age of calf	Ayrshire—Shorthorn				Holstein—Brown Swiss				Guernsey				Jersey			
	Whole milk	Skim milk	Grain	Good hay equiv-alent	Whole milk	Skim milk	Grain	Good hay equiv-alent	Whole milk	Skim milk	Grain	Good hay equiv-alent	Whole milk	Skim milk	Grain	Good hay equiv-alent
	Lb.	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*
13th month	..	..	3.0	11.0	..	..	3.0	13.4	..	..	3.0	10.5	..	..	3.0	9.8
14th month	..	..	3.0	11.5	..	..	3.0	13.8	..	..	3.0	10.9	..	..	3.0	10.0
15th month	..	..	3.0	11.9	..	..	3.0	14.1	..	..	3.0	11.1	..	..	3.0	10.3
16th month	..	..	3.0	12.2	..	..	3.0	14.4	..	..	3.0	11.3	..	..	3.0	10.5
17th month	..	..	3.0	12.4	..	..	3.0	14.7	..	..	3.0	11.6	..	..	3.0	10.7
18th month	..	..	3.0	12.8	..	..	3.0	15.1	..	..	3.0	11.9	..	..	3.0	11.0
19th month	..	..	3.0	13.1	..	..	3.0	15.4	..	..	3.0	12.2	..	..	3.0	11.4
20th month	..	..	3.0	13.6	..	..	3.0	15.6	..	..	3.0	12.5	..	..	3.0	11.7
21st month	..	..	3.0	13.9	..	..	3.0	16.1	..	..	3.0	12.8	..	..	3.0	12.1
22nd month	..	..	3.0	14.5	..	..	3.0	16.5	..	..	3.0	13.4	..	..	3.0	12.7
23rd month	..	..	3.0	15.3	..	..	3.0	17.1	..	..	3.0	14.2	..	..	3.0	13.3
24th month	..	..	3.0	15.8	..	..	3.0	17.6	..	..	3.0	14.7	..	..	3.0	13.9
12 months to 18 months	..	..	547	2197	...	...	547	2608	..	..	547	2052	..	..	547	1935
18 months to 24 months	..	..	547	2616	...	...	547	2983	..	..	547	2422	..	..	547	2279
Total, 12 months to 24 months	..	..	1094	4813	...	...	1094	5591	..	..	1094	4474	..	..	1094	4214
Total, birth to 24 months	189	2063	1946	6868	224	2191	2008	8176	182	2008	1946	6422	154	1853	1925	6083

[1] Modified from chart appearing in Food and Life—Yearbook of U. S. Dept. of Agri., 1939.

CARE OF THE HEIFER UNTIL FRESHENING

Winter feeding.—Heifers from one to two years old need about the same care as the six or eight months old heifers. Because of their greater size, however, they will consume more feed than their younger sisters. Roughage should make up the greater part of their ration. Good quality alfalfa or other legume hay is best and should be fed liberally. A good measure is to feed all they will clean up. In addition it is a good practice to feed ten to fifteen pounds of silage and one-fourth to one-half pound of grain for each hundred pounds of live weight. The amount of grain to be fed will depend on the condition of the heifer. Any one of the three grain mixtures mentioned before in this manual will supply the dairy heifer's needs. An abundance of pure water should be available for the heifer. In cold weather and where water is supplied in an outside tank, some means of keeping it from freezing should be employed.



Shade Should be Provided

Summer feeding.—Good green pastures furnish well balanced rations which are high in protein and minerals. Pastures simplify the care and feeding of the heifer very materially. If the pasture is good and not too heavily stocked, little or no grain will be needed. If native pastures dry up in late summer and fall, grain is needed in order to insure steady growth. The amount of grain will depend on the condition of the pasture as well as that of the heifer.

Quarters for the heifer.—Heifers require dry, well bedded and well ventilated quarters, such as a pen in the barn or an open shed facing the south. An open shed with a lot or paddock attached has the advantage of the exercise it offers. In summer a shelter should be provided in case there is not plenty of natural shade. This can be an old building or a temporary shed. In case the heifers are to be shown, it is well to provide a darkened shelter which will give them protection from flies.

Breeding age.—The age of breeding will depend upon the growth and development of the individual. Jerseys and Guernseys mature a little earlier than Holsteins, Ayrshires, and Brown Swiss, and as a rule can be bred at an earlier age than the other breeds mentioned. In general, all breeds can be bred between fifteen and eighteen months of age. This will bring the first calving between twenty-four and twenty-seven months. The owner should, if at all possible, arrange to have his cows or heifers freshen in the fall.

CARE AND FEEDING OF THE YOUNG COW

Feeding before freshening.—Proper feeding before freshening insures the birth of a strong, vigorous calf. It also adds growth and size to the heifer. Liberal feeding of a slightly laxative ration, rich in protein, vitamins and minerals, should be the practice.

A satisfactory grain mixture for this period is two parts ground corn or barley (by weight), two parts ground oats, two parts wheat bran, and one part linseed oil meal. The grain ration should be supplemented with a legume roughage of good quality.

Two or three weeks before the heifers freshen, the amount of grain fed should be reduced to one-half or one-third the regular amount, and it is best to omit the corn or barley entirely. Keep the heifer in a laxative condition. Light feeds of ground oats and bran will be satisfactory for this period.

Care at calving time.—In case the heifer freshens in the fall or winter and not in the pasture, a roomy, well-lighted stall should be provided. She should be removed from the herd several days before time to freshen and placed in a box stall. This will give her time to get well acquainted with her new quarters before the calf is born. The stall should be thoroughly cleansed and disinfected with a coal tar disinfectant and fresh, new bedding should be supplied.

After freshening, the heifer should be kept dry and warm and in out of bad weather. Her vitality is lowered following calving and good care is essential for a few days in order to get her back to normal strength. Lukewarm water should be supplied every few hours for drinking. A good quality of legume hay and a bran mash will be the only feed necessary for a few days.

Feeding for milk production.—Since it will take the heifer two or three weeks to reach a maximum milk flow as well as to recover from calving, it will be necessary to feed lightly for several days. After the first two days she may be gradually started on the ration that she is to receive during her lactation period. It will take from two to three weeks to get her on full feed.

Roughage.—A combination of legume hay and silage makes a very desirable roughage for dairy cows. In every case, legume hay should form a part of the roughage. A good roughage is one of the most valuable feeds for the dairy cow. In Nebraska, alfalfa hay is largely used, because it is palatable, is high in protein, and is a good source of minerals and vitamins. By using a good grade of legume hay, smaller amounts of protein may be used in the grain mixture, thus cutting down the cost of feeding.

Silage is very valuable as a roughage. In the fall and winter it takes the place of pasture by adding succulence. It has an excellent physical effect on the animal and stimulates the appetite when silage and a legume hay are used as roughages. Feed approximately one pound of hay for every hundred pounds of live weight and three pounds of silage for the same amount of weight. Most dairymen feed what hay a cow will clean up readily and between thirty and forty pounds of silage daily.

Non-legume hays such as timothy, corn stalks, and red top, are poor roughages for cows in milk. They are low in protein and minerals. If any of these non-legume hays are fed, it will be necessary to add more protein to the grain mixture which will increase the cost of the grain fed.

Feeding grain mixture.—Home grown grain such as corn, oats, and barley, should be used as extensively as possible in the dairy cow's ration. In order to supply the cow with enough protein for her maintenance and milk flow, it will be necessary to add such feeds as linseed oil meal, cotton seed meal, wheat bran or gluten feed to the home grown grains which are low in protein.

The following grain mixtures are often used:

1		2	
Ground corn	400	Ground corn and cob	300
Ground oats	300	Ground oats	200
Wheat bran	200	Linseed oil meal	100
Mixture	900	Mixture	600
Protein content	9.1%	Protein content	11.3%

3		4	
Ground corn	200	Ground barley	300
Ground oats	100	Ground oats	200
Wheat bran	100	Wheat bran	100
Oil meal	100	Cottonseed meal	100
Mixture	500	Mixture	700
Protein content	13.8%	Protein content	14.0%

The grain mixture should be fed according to production. Failure to follow this principle in feeding dairy cows usually results in waste of feed and a loss of milk production. The amount of milk produced daily should be the guide. Feed one pound of one of the above mixtures for each three to four pounds of milk produced daily.

Substitutions.—Barley or sorghum grain can be substituted in a ration for corn. Cottonseed meal or ground soy beans can be substituted for linseed oil meal. One hundred and twenty-five pounds of corn and cob are equal to one hundred pounds of ground corn. For more detailed information regarding feeding and management of the dairy calf see Extension Circular 622, "Dairy Calf Care and Management."

Summer feeding.—In the spring and early summer dairy cows usually produce well because they have access to good pasture which is one of nature's best feeds. Grass is palatable and succulent and provides protein, minerals, and vitamins. Even when pasture is abundant cows should receive some grain, especially the high producing ones. It tends to keep them from losing flesh as they otherwise would.

During the hot, dry summer and fall months, grain is very essential for the dairy cow. When pastures become burnt and dry, they furnish very little succulent feed. The summer ration need be only ground corn and ground oats, equal parts, and while the pasture is good, one pound of grain will suffice for eight or ten pounds of milk produced.

Native grasses cannot be depended upon for any length of time so the best dairymen have supplemental pastures of sweet clover or sudan grass on which they can turn their cattle after the native and blue grass pastures are gone. Pasture is a cheap source of feed and should be used for as long a period as possible. (See Extension Circular 621, "Feeding Dairy Cattle.")

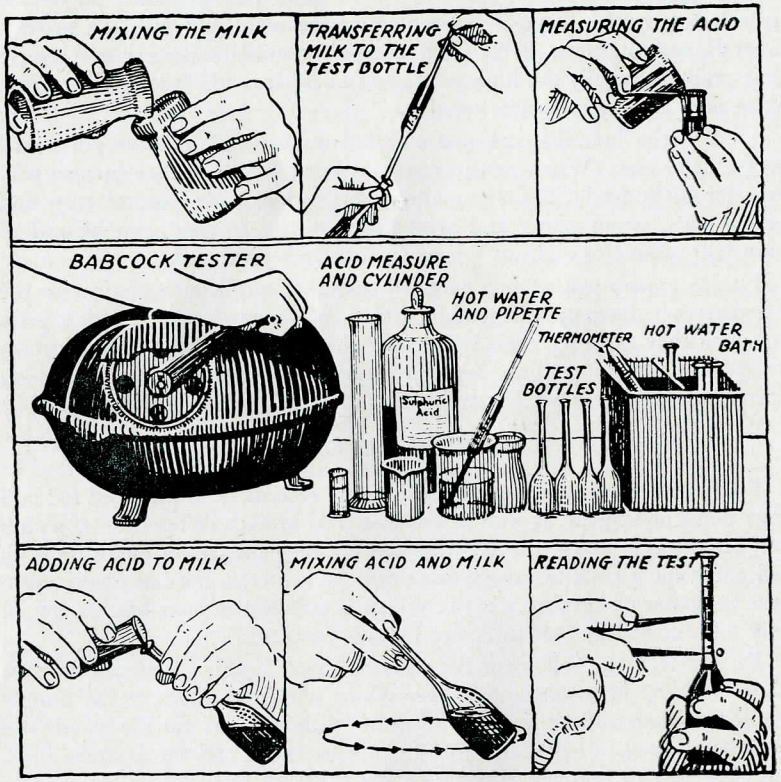
KEEPING RECORDS

Every club member should keep accurate records of all the feed fed and other items of expense as well as the gain and growth of his calf. If a club member neglects to keep records, he has not only missed an opportunity to find out what it costs to raise a calf until she is a cow, but has neglected to form the habit of keeping records, which is essential in later life. A special book is furnished by the club office for this purpose.

Do not feed the calf from the common herd supply. It is best to have a box or barrel in a convenient place which will hold a two weeks' supply of grain. When adding a supply of grain, weigh it and put the weights in your record book. If this amount of grain feeds the calf for fourteen days, it is very easy to find out how much she is eating each day of the month. The amount of roughage fed in a month may be estimated by multiplying the amount fed per day by the calendar days in a month. All records should be kept for each month during the entire three years, or until the project is finished.

Production records.—One of the most interesting phases of the dairy calf club project is keeping the milk and butterfat record. This usually comes in the third year of the project. Although the club member owns a heifer from a dam with over 300 pounds butterfat record, this fact is no excuse for not keeping records on the heifer. In fact, it makes them more important. The records will serve as a guide in feeding the heifer and will indicate her ability as a producer. It will show the amount of milk and butterfat she produces during the year and the amount of feed consumed. Keeping production records will not only prove valuable to the club member in estimating the cost of production, but will add commercial value to the herd and its offspring.

HOW TO MAKE THE BABCOCK TEST



Steps in the Babcock Test

1. Take a small sample from the morning and night milkings, after mixing well, for each cow, and put it in a tightly capped sample bottle.
2. Clean test bottles and pipette.
3. Thoroughly mix the milk sample before removing the bottle cap.
4. Mark the test bottles so you can identify the cows. Make tests in duplicate for each cow.
5. Fill the pipette to the 17.6 cc. mark and empty into test bottle.
6. Fill the acid measure to the 17.5 cc. mark and add slowly to the milk, rolling the neck of the bottle between your fingers so the acid will wash all the milk down.
7. Mix acid and milk gradually by giving bottle a horizontal rotary wrist motion away from operator.
8. Place bottles in tester and whirl 5 minutes at the indicated speed.
9. Add hot water bringing contents up to neck of the bottle.
10. Whirl 3 minutes more.
11. Add enough hot water to bring butterfat column into the graduations on the neck of the bottle.
12. Whirl one minute.
13. Place bottles in water heated to 140° F.; leave in water bath for a few minutes.
14. Read the test, using dividers.
15. Record your results.

How to measure milk and butterfat production.—Each club member should have a milk scale hanging in a convenient place so that after milking the milk can be weighed. Milk sheets for recording the weights are furnished by the Agricultural College Extension Service, University of Nebraska, as a part of the club supplies.

Equal samples from the night and morning milkings should be taken one day each month and tested for butterfat. The first sample should not be taken until a week after freshening and samples taken four weeks apart thereafter.

Great care must be exercised in taking the sample. A true sample is all that should be used. After the heifer is milked dry, take her total amount of milk, pour it from one pail to another three or four times and then take the sample. If the samples are not properly taken, the results will be misleading.

In case the club member's father is a member of the dairy herd improvement association, the cow tester can test the milk for the club member. If this is not the case, then arrangements can be made to have the samples tested at a local creamery, milk station, or cream station. It is possible for the club member or the club to own a testing outfit. The club leader can assist in securing the proper equipment for this work.

After the sample is tested, the amount of butterfat produced during the month may be computed. For example: if the heifer produced 800 pounds of milk during the month and the test showed that it contained 4 per cent butterfat, the amount of butterfat produced for the month is 4 per cent of 800 pounds or 32 pounds.

FITTING THE DAIRY CALF FOR SHOW

The primary object of showing animals in competition is to encourage the breeding and feeding of improved types of livestock. This is best accomplished by our modern show where large numbers of animals can be exhibited and compared.

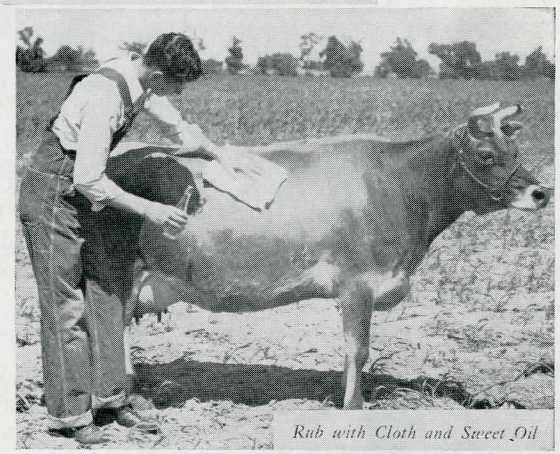
Comparative judging will bring to light the strong and weak points of the calves. If a club member is progressive and alert, he can profit by the experience he gets from showing his calf in competition with others. Showing also creates the desire to own and breed better dairy cattle.

There are several important factors in fitting animals, namely, feeding, growing, washing, blanketing, clipping, polishing horns, and feet.

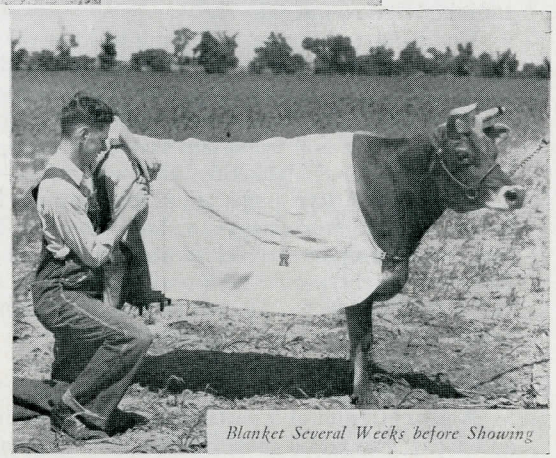
Feeding.—Active preparation for showing begins eight or ten weeks before the exhibitor expects to show his calf. The animal should look its best, which implies careful feeding and management. Getting a young dairy calf in the proper flesh and condition to show is no easy task. The calf should *not be too fat,* but should carry enough flesh to give it a good, healthy sleek appearance. Careful feeding of grain two months before showing should accomplish the desired results. The ration should be one that stimulates growth rather than excess flesh.

A fitting ration of 5 parts bran, 3 parts ground oats, 1 part ground corn, and 1 part linseed oil meal is often used. The amount to be fed should be

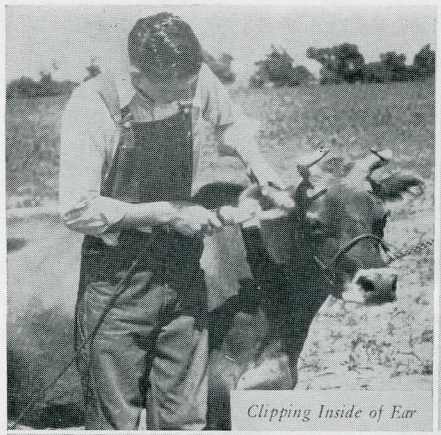
Brushing Keeps Hair and Hide in Good Condition



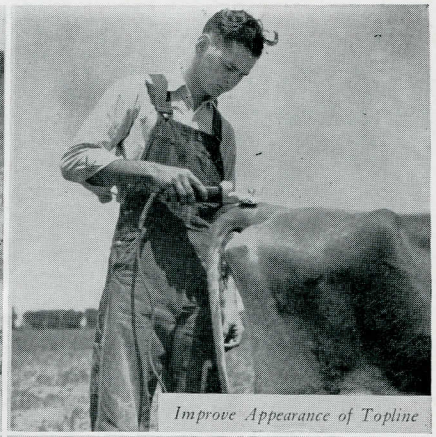
Rub with Cloth and Sweet Oil



Blanket Several Weeks before Showing

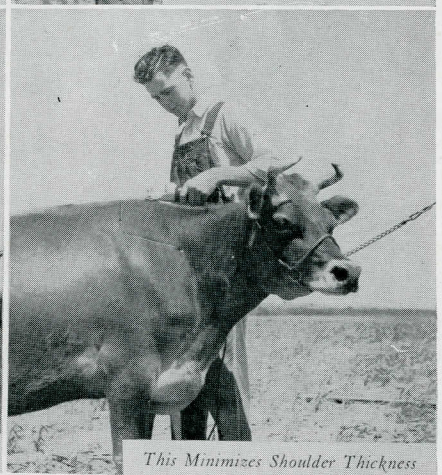


Clipping Inside of Ear

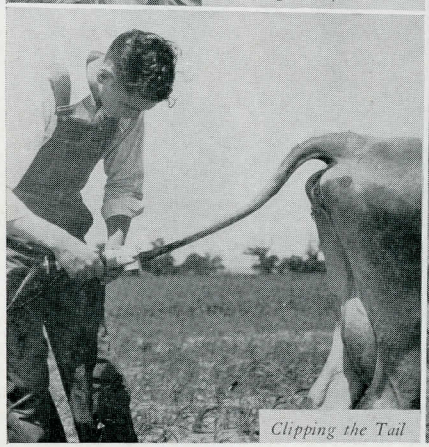


Improve Appearance of Topline

Clipping Hair from Face

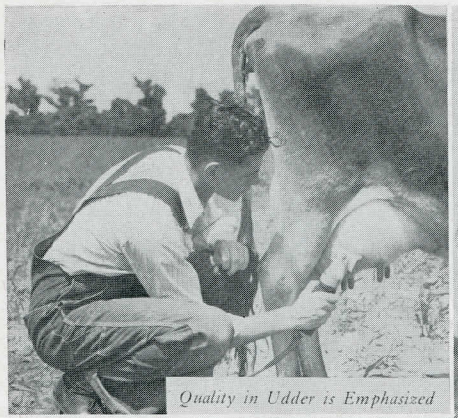


This Minimizes Shoulder Thickness

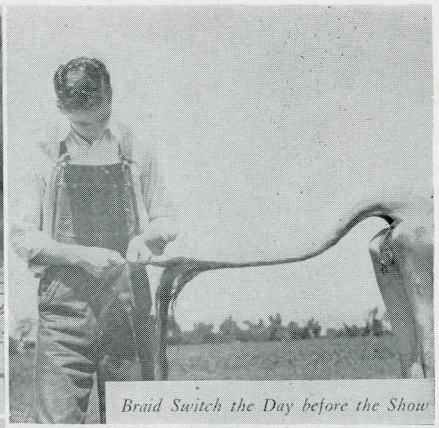


Clipping the Tail

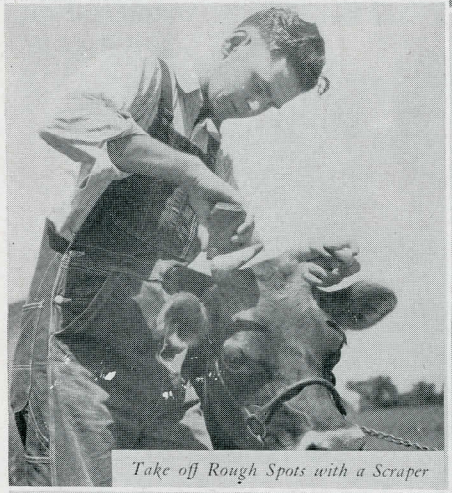
This Emphasizes Milk Veins



Quality in Udder is Emphasized

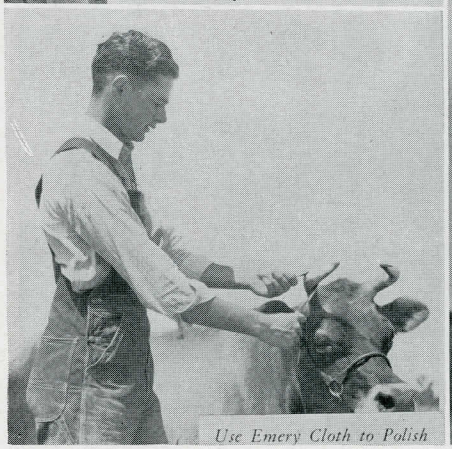


Braid Switch the Day before the Show

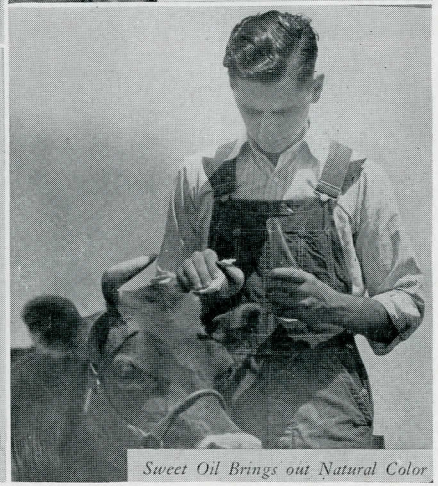


Take off Rough Spots with a Scraper

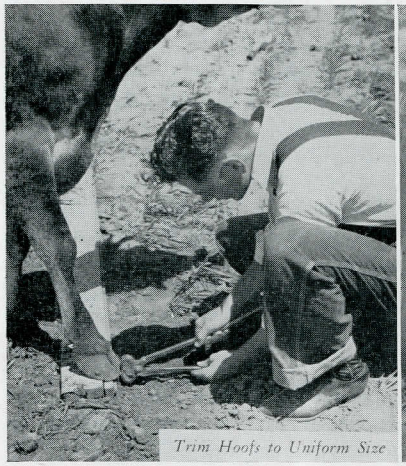
Follow the Scraper with a Rasp



Use Emery Cloth to Polish



Sweet Oil Brings out Natural Color



Trim Hoofs to Uniform Size

Smooth Rough Edges with a Rasp

governed by the condition of the calf. Good judgment must be employed since no rule for feeding will fit all individuals and conditions. Feed plenty of good alfalfa or other legume hay in case alfalfa is not available.

The calf should be housed during the day in a well-bedded and well-ventilated stall. This practice should be adopted when the weather is hot and the flies bad. In case box stalls are not available, an open shed or other building can be used. Darkening the stall with burlap sacks placed over the door or openings will help to control the flies and make the calf more comfortable.

If pasture is near, it is well to turn the calf out at night for exercise and grazing. The exercise is essential to good health and appetite. Plenty of fresh water should be available at all times. If the calf is watered from a pail, the pail should be scrubbed out every few days. Keep salt blocks or salt in a box before the animal at all times.

Grooming.—The animal should be carefully groomed or brushed once each day to get rid of the dirt and help make the hair smooth and glossy. A brush with medium stiff bristles is best for this operation. After brushing, rub the hair with a soft cloth slightly oiled with sweet oil. Hand massaging is also good for the hide and hair. It tends to make the hair sleek and the hide soft and mellow.

Washing.—The only way an animal can be kept entirely clean is by washing off the dirt and stains that cannot be removed by brushing. The animal should not be washed too often since washing tends to make the skin dry and the hair loses its luster. One or two washings in a season are often enough.

In washing, first wet the animal, then work up a lather all over the animal's body with the use of tar soap. The lather should be well worked into the hair and hide. After the dirt is well loosened, the soap should be rinsed out thoroughly.

Dry the hair by rubbing with a soft cloth. The switch should be made clean and fluffy. In order to do this, carefully wash the switch of the tail and braid it into several small braids, tie a string on the end and leave over night. About an hour before going into the show ring, unbraid, comb, and fluff the tail out.

Blanketing.—All good showmen have their animals blanketed early, several weeks before showing. This is a very important factor in fitting. Blanketing keeps the animal clean and protects it from flies. In case the dairy calf has a thick, heavy hide, blanketing will help to soften it and improve the condition and quality. Burlap bags sewed together make a satisfactory blanket. It is a good practice to remove the blanket each day and brush and groom the animal. This gives the hair and hide a chance to air out.

Clipping.—Unless the hair is especially long and shaggy it is not necessary to clip the animal's entire body. However, about six weeks before showing it is always advisable to clip the head, ears, neck, tail, and underline. This gives the animal a dressed up appearance and helps to bring out dairy character. Repeat the clipping a day or so before the animal is to be shown. In doing this work be sure the clipper is properly adjusted and that it is doing good work. A poor job of clipping is worse than no clipping at all and often spoils a calf's chance in the show ring. The last clipping should be done so as to even up the calf's lines, straighten up the top line, and smooth up the tail setting. Clip against the grain of the hair. All producing females should be clipped under the body. This gives a more clean-cut appearance and shows up the veining to a greater advantage.

Polishing hoofs and horns.—Neat, shapely horns add to the appearance of the dairy calf. If the horns are out of shape, horn trainers put on early will help to correct this condition.

In trimming or dressing up the horns it may be best to use a rasp first. This will take off all the rough and uneven parts of the horn. Sometimes a steel scraper is used instead. This operation should be followed with common sand paper to make the horn smooth. After this use fine emery paper.

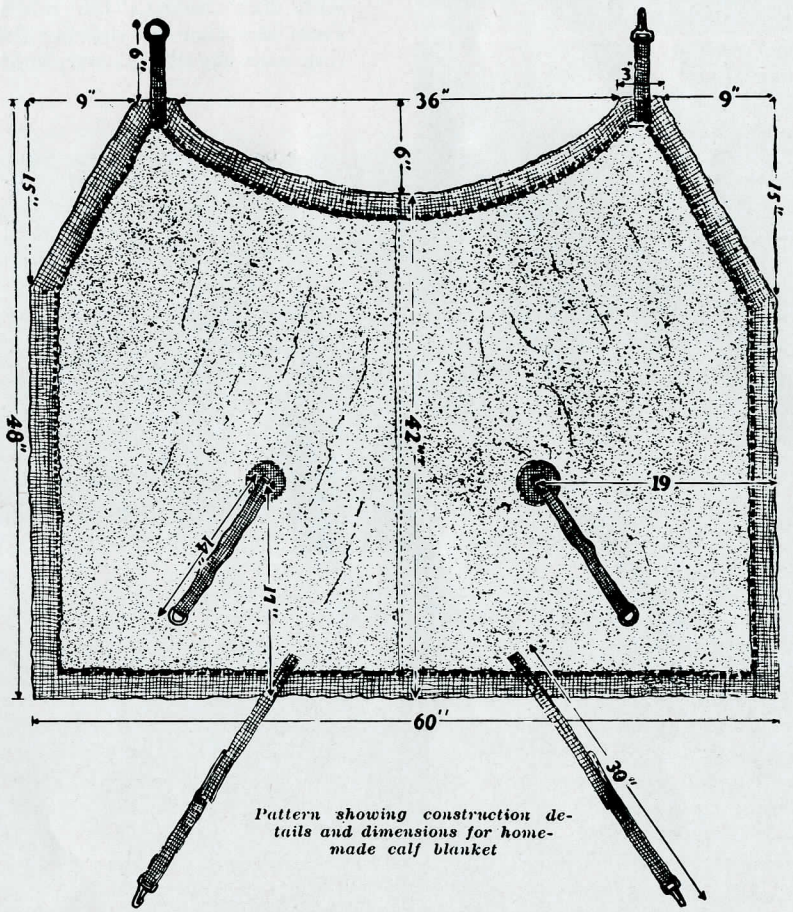
In order to bring out a shiny appearance, the horns should be polished by the use of a flannel cloth and sweet oil. With the first strip of flannel see-saw the horn for three or four minutes. This operation can be repeated as often as the caretaker desires. The last strip of flannel should be used dry. Continue rubbing until the proper polish is obtained.

The feet of the calf often grow uneven and sometimes badly out of shape. The beginner should study the natural shaped foot, so when the time comes to trim and shape the feet of his calf he will know how to go about it. Several things should be kept in mind. First, keep the sole level; second, trim down the side walls; third, lower the heels and have the points of the toes even. A pair of pincers and a rasp are the tools needed. The polishing requires about the same procedure as the work on the horns.

Training the calf.—Successful showmen start early to teach the calf to lead and pose. Training animals to behave and respond to certain commands takes time and patience. In the first place, have the confidence of the animal with which you are working. Give it time to learn.

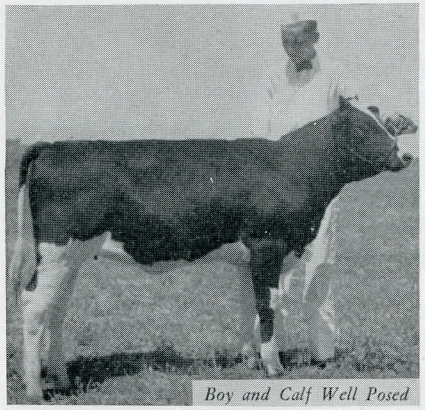
Leading the calf is one of the first steps in training. This is often easily acomplished by leading the calf to water or to pasture. Leading and posing the calf a little each day is a good practice. In a very short time the calf will learn to walk, stand, and place its feet with very little effort on the part of the showman.

In posing, place the feet so that the top line is straight and the rump is as level as possible. Keep the head up and the calf alert. Take every opportunity to show the calf to visitors. This has a tendency to get the calf accustomed to strangers and helps later on in showing.



Pattern showing construction details and dimensions for homemade calf blanket

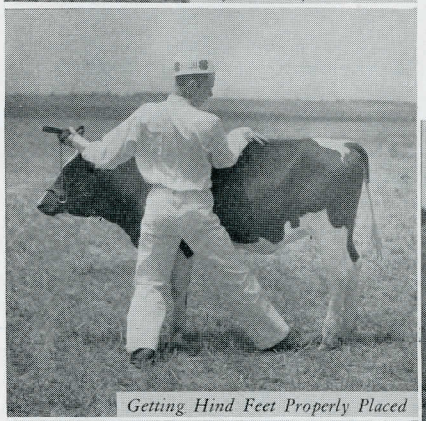
How to Make a Blanket



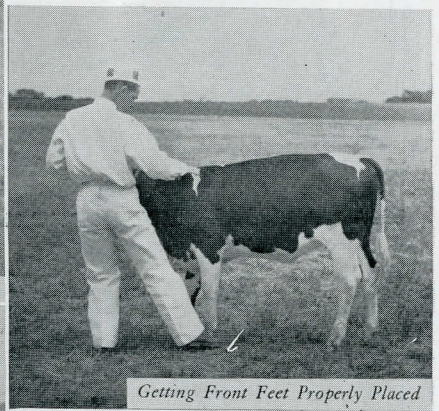
Boy and Calf Well Posed

SHOWING THE CALF

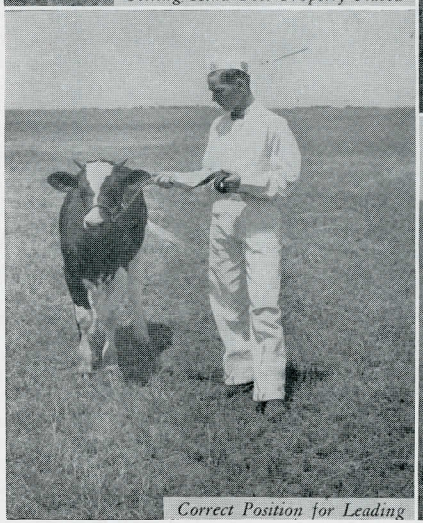
In the show ring, walk on the left side in leading. Hold the lead rope in the hand nearest the calf. Coil the extra rope and hold it in the same hand. Keep an eye on the judge. Of course, pay attention to the calf to make sure she is correctly posed and looking her best. As soon as the calf is in a correct position do not try to move or change her. Some showmen have a tendency to fuss with their animals too much. From the time of entering the ring until the ribbons are placed,



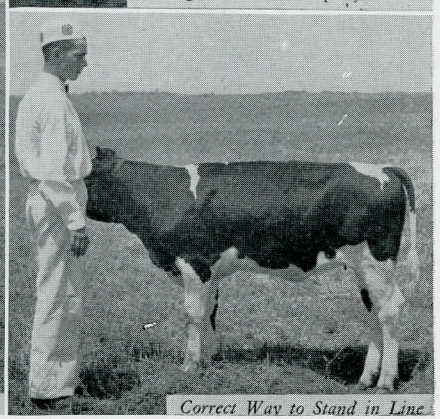
Getting Hind Feet Properly Placed



Getting Front Feet Properly Placed



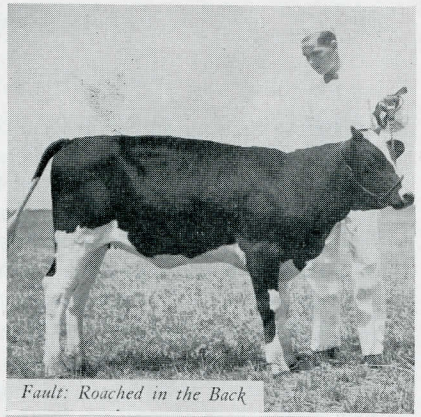
Correct Position for Leading



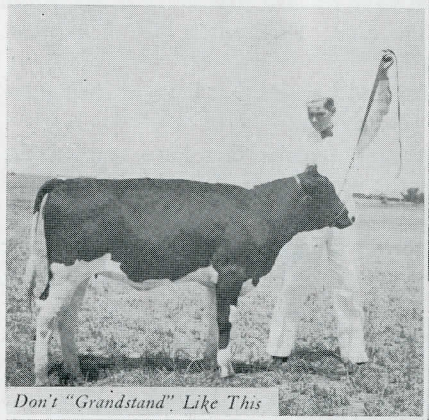
Correct Way to Stand in Line

give all attention to showing. Never stand between the calf and the judges. Be ready to walk or move the calf when the judge directs. Never interfere with other showmen and be courteous at all times. Never lead in front of other calves and showmen.

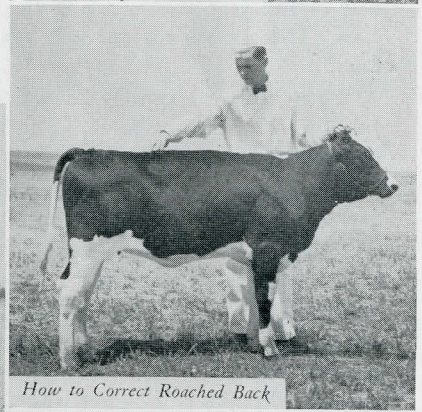
All club members are good sportsmen, so whether winning or losing a good club member should smile and be ready to encourage the less fortunate or congratulate the winners. Ask the judge for the reasons for his placings if they are not obvious and try to profit by his explanations.



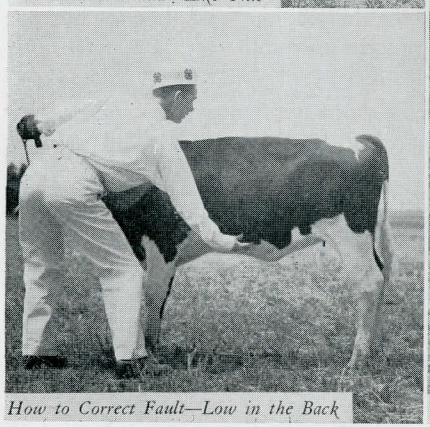
Fault: Roached in the Back



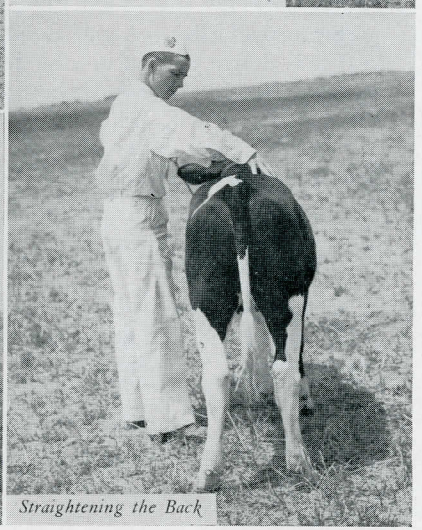
Don't "Grandstand" Like This



How to Correct Roached Back



How to Correct Fault—Low in the Back



Straightening the Back

SHOW RING CLASSIFICATION

Before making entries at local or state fairs, it is well for the showman to know the common classifications. To enter stock in wrong classes is a bother not only to the owner and fair secretary, but to other exhibitors as well. All classes of dairy cattle have the same basis for determining age classification. The first day of July of the year shown determines the age of all senior classes. Example: If an animal is three years old on or after the first day of July, that animal will be shown in the two-year-old class, but if three years old on or before the 30th of June, the animal will show as a three-year-old.

Five-year-old section.—Cows that are five years old or older before July first of the year shown are in this class. It is often called the aged cow class. This section may or may not be included in the classification of all fairs.

Four-year-old section.—Cows that have reached four years of age before July first of the year shown are in this class. This section may or may not be included in all fair classifications.

Three-year-old section.—For males and females that have reached three years of age before July first of the year shown.

Two-year-old section.—For males and females that have reached the age of two years before July first of the year shown. Female class may be divided into two-year-olds (in milk) and two-year-olds (never freshened).

Yearling section.—The yearling classes are generally divided into junior and senior classes, ages computed January first and July first as in the junior and senior calf classes which follow.

Senior calf class.—A calf dropped before the first day of January the year it is shown and on or after July first of the previous year. Example: Senior calves for 1940 must be dropped on or after July first, 1939, and before January first, 1940. At most of the leading fairs there is but one calf class. It is for calves over four months and under one year, using July first as the age determining date.

Junior calf class.—A calf dropped on or after January first of the year shown. Example: Junior calves for 1940 must be dropped on or after January first of 1940.

Champions.—In the larger shows there are three championships: junior, senior, and grand. All first prize winners of the various classes compete for championships. All winners of the classes two years old and over compete for senior champion. All winners of the classes under two years old compete for junior champion. Then the junior and senior champions come together for grand champion.

Group classes.—An exhibitor entering animals in the group classes should read the rules in the fair catalog very carefully. For the beginner these rules are hard to understand and often mistakes are made in making the entries. Also it will be found that fairs differ on their rules and requirements for the group classes.

Graded herd.—Five animals in group; one bull two years old or over, one cow three years old or over, one heifer two and under three, one heifer one and under two, and one heifer under one year.

Yearling herd.—Five animals in group; one bull under two years, two heifers over one year and under two, two heifer calves four months and under one year, the heifers to be bred by exhibitor.

Calf herd.—Three animals in group; one bull and two heifers, all under one year, heifers bred by exhibitor.

Get of sire.—Four animals, any age, both sexes to be represented, all get of one sire.

Produce of dam.—Two animals of either sex out of same dam.

DETERMINING AGE OF CATTLE BY TEETH

The age of cattle can be approximated closely by the appearance, development, and subsequent wear of their second incisor teeth. Cattle have eight incisor teeth, all in the lower jaw. In the calf at birth two or more of the temporary or first incisor teeth are present. With the first month the entire eight incisors have appeared.

As the animal approaches 2 years of age the center pair of temporary incisor teeth or pinchers are replaced by the permanent pinchers which at 2 years attain full development.

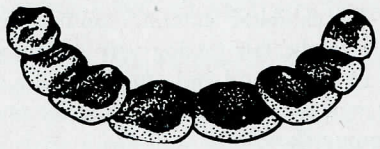
At from 2½ to 3 years the permanent first intermediates are cut and are usually fully developed at 3 years.

At 4½ to 5 years the corner teeth are replaced, the animal at 5 years having the full complement of incisors with the corners fully developed.

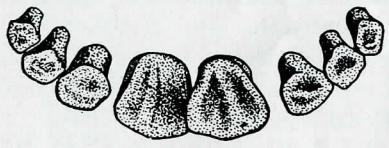
At 5 to 6 years there is a leveling of the permanent pinchers, the pinchers usually being leveled at six and both pairs of intermediates partially leveled and the corner incisors showing wear.

From 7 to 8 the pinchers are noticeably worn; from 8 to 9 middle pairs, and by 10 years the corner teeth.

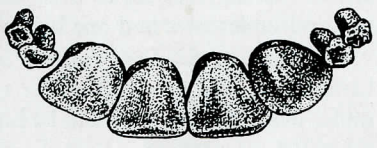
After 6 years the arch gradually loses its rounded contour and becomes nearly straight by the twelfth year. In the meantime the teeth have gradually become triangular in shape, distinctly separated and show the progressive wearing to stubs. (Farmers' Bulletin 1066.)



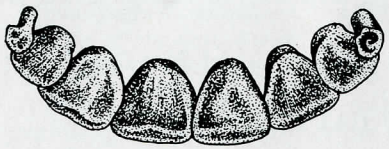
Internal Face of Incisors of the Calf



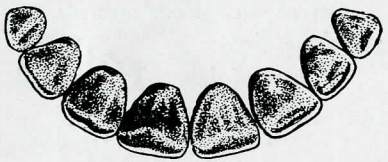
At Two Years



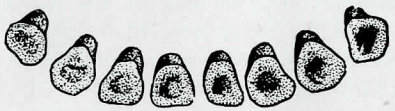
At Three Years



At Four Years



At Five Years



At Twelve Years

HOW TO CARE FOR COMMON AILMENTS

Good herd management, good feeding with an abundance of fresh water and plenty of exercise, coupled with the precaution against introducing disease into the herd, will mean more to the stockman's success than any other things he can do.

Young calves, in spite of good care and careful feeding, sometimes get sick and need special attention. In case of diseases other than a few common ailments, it is always best to call a competent veterinarian and have the animal treated in the proper manner. Only a few suggestions can be made here on the prevention of a few of the more common dairy calf ailments.

Scours.—Ordinary scours is one of the most common ailments of dairy calves and is the cause of great losses every year. The trouble may be caused by depriving the calf of the mother's first milk; it should receive such milk for the first three or four days. It might also be caused by feeding too much milk, feeding at irregular temperatures, milk too rich in butterfat, sour or dirty milk, dirty feeding utensils, or cold, damp, unhealthful quarters.

When trouble of this kind occurs it is best to reduce the amount of feed at least one-half. Give one to three ounces of castor oil, which will help to clean the digestive tract. Sometimes the injection of white scours serum is very effective. Bloody scours or coccidiosis is usually caused by microscopic animal parasites known as coccidia. Any calf affected with scours should be immediately isolated from other healthy calves. Clean up the quarters and make the animal comfortable. If no improvement is noted, call a competent veterinarian.

Pneumonia.—Pneumonia is caused by infection. Overheated or poorly ventilated barns or sudden exposure to bad storms may be the predisposing causes. Animals look depressed, breathe rapidly, cough and run a temperature. Animals sick with pneumonia should be made comfortable by being taken away from other animals and put in a dry, well ventilated stall. Allow plenty of fresh water. A veterinarian should be called to administer drugs and give instruction for the care of the very sick animals.

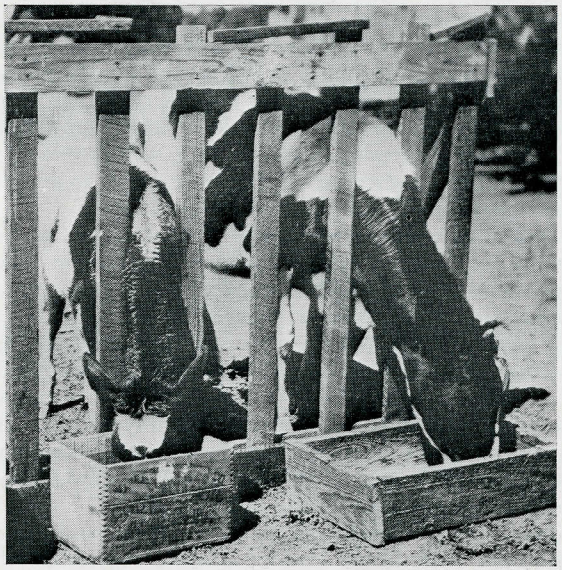
Bloat.—Due to excessive fermentation of food in the paunch with an accumulation of gas. A great number of things may cause bloat. Animals that are in poor condition and underfed are more likely to be affected. Any green feeds such as alfalfa or clover, when eaten in large quantities, often cause bloat. Great care should be exercised in turning cattle on green, abundant pasture, or in the feeding of too much green feed of any kind. In case an animal is badly bloated it may be necessary to puncture the paunch with a trocar through the left side half way between the hip bone and last rib in order to let the gas escape. In case the animal is not severely bloated, a stick tied in bridle fashion and put in the mouth may assist in relieving the bloated condition.

Ring worm.—Ring worm is caused by a fungus and usually appears about the head and neck in the form of a white scaly crust. To treat, remove the crust by washing with soap and water. Then paint the affected area with tincture of iodine; or one part of tincture of iodine and two parts glycerine; or crude oil; or sulphur ointment. Do this once a day for several days. In order to keep the disease from spreading, keep the infected animals separated from the others and thoroughly disinfect the stalls or pens.

Lice.—Lice annoy a calf and lower its vitality as well as stunting its growth. They should be gotten rid of at once. Lice may be removed by washing the calf with some coal tar disinfectant used at the rate of 1 part to 50 parts water. Dry the calf thoroughly after this treatment. Repeat the treatment in about one week. In case the weather is very cold, powdered sabadilla seed can be dusted into the hair and good results obtained, many stockmen using nothing else. The application of raw linseed oil with a brush every three or four days until four applications have been given is very effective. Do not exercise the animal immediately after oiling. Keep animal away from strong sunlight for twelve hours.

Poisoning.—Cattle are very susceptible to lead poisoning. Keep them away from freshly painted barns and sheds, and also away from old paint buckets. Care should be exercised that animals cannot eat poisons put out for rats, gophers, or other such pests.

Licking and sucking.—Some calves get the habit of sucking each others' ears or udders after they drink their milk. This is injurious to both animals. Care should be exercised after feeding in order to stop such habits. Calves should be locked in stanchions and given a little grain as soon as they are through drinking their milk. The grain tends to take the taste of milk out of their mouth and stops them from sucking one another.



Stanchions Prevent Sucking and Licking after a Feeding of Milk

Blackleg.—Blackleg is a very deadly disease and calves of all kinds in Nebraska should be vaccinated against it. In order to insure complete immunity calves should be vaccinated at about six months of age and also when they are a year old.

Warts.—Warts are very common on young cattle. They are caused by a virus which is easily spread from one animal to another. In case a calf has some warts growing on its body, the caretaker should be careful when grooming not to scratch the animal's body in other places since the virus will be carried to the injury and other warts started. They can be removed by applying castor oil. Applications should be made until the warts disappear. Long warts which hang down can be clipped off with a pair of scissors.

Sore eyes.—Young calves often get sore eyes and there are several causes for this trouble. In the summer time it may be caused by flies, injury or infection. The condition can be helped and often cured by bathing the eyes with a dilute salt solution or boric acid.

4-H JUNIOR DAIRY BULL ASSOCIATIONS

It is not always possible for Dairy Calf Club members to find suitable bulls in their community to which they may breed their heifers when they become of breeding age. One of the best means of providing suitable bulls at a nominal cost is the 4-H Junior Co-operative Bull Association. The following working plan is suggested.

Object.—The purpose for which this association is formed is to develop 4-H dairy cattle of higher producing ability and better type. This is to be accomplished principally by the joint purchase, ownership, use and exchange of meritorious purebred bulls.

Membership and officers.—The membership in this association shall be limited to past or present 4-H Club members, who will agree to comply with all the rules of the organization, and are approved by the Board of Directors. One director shall be chosen from each block by the members of that block. Term of office shall be one year. The directors shall by ballot elect from their own number a president, vice-president, and secretary-treasurer.

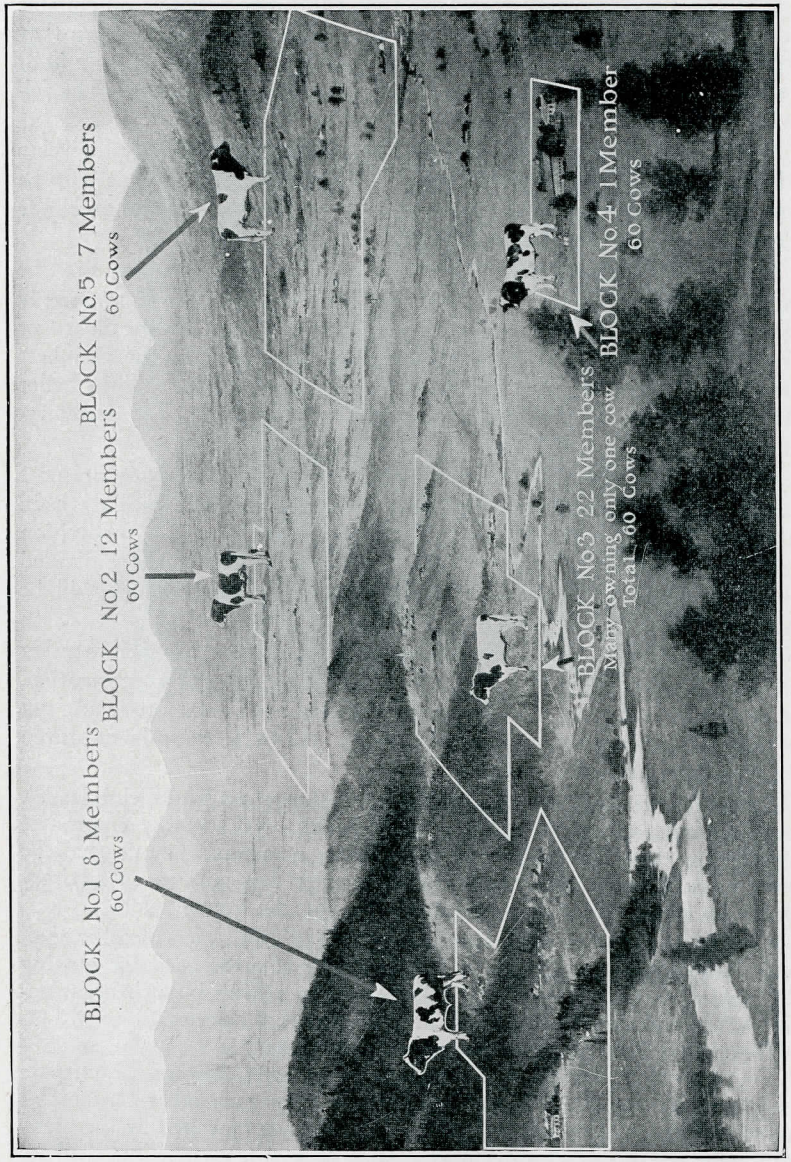
Plan of organization.—The bull association shall have three or more blocks, a bull to be placed in each block, so that all members will be within reasonable distance of the bulls. The term block shall mean a subdivision of the bull association served by one bull. The association shall be divided into as many blocks as the directors find advisable. Each block will be designated by a number.

The bulls shall be purchased and owned by the association, each member having a share in all bulls. The bulls shall be of superior conformation, free of disease, and from high-producing ancestry from dams producing not less than 500 pounds of butterfat at maturity. All bulls are to be approved by a state dairy extension specialist.

All bull associations will be organized and supervised by the club leader, county agricultural agent, and state club leader. An advisory committee of not more than five composed of the club members' parents shall be elected at each annual meeting. This committee acts only in an advisory capacity on any question that might arise within the organization.

Aside from the assessment for the purchase of bulls, each member shall pay a membership fee of .....; this money is to be used for moving bulls, paying veterinary bills, and other expenses arising in such organization. All expenditures to be approved by the board of directors.

The annual meeting of the association shall be held at ..... on ..... day of .....each year for the purpose of selecting the board of directors, and transacting such other business as may come before the meeting. Special meetings may be called by the president, or by the board of directors. Notice of a special meeting shall be given by the secretary to all members.



A Cooperative Bull Association (U. S. D. A.)

Dissolution.—This association can be dissolved only by action taken at a regular meeting when three-fourths of the members are present, and when three-fourths of those present vote in favor thereof.

Withdrawal.—Any member who wishes to withdraw shall give a written notice to the president of the association before the annual meeting.

Compensation.—Any member who has withdrawn from the association shall receive such reasonable compensation for his investment in the club as the directors decide is equitable.

Care and management of the bulls.—The board of directors shall designate the place for keeping the bulls, and arrange in each block a suitable pen and equipment necessary for the safety of the keeper and health of the bull. All bulls shall be rung. Each block director shall see to it that the bull in his territory is getting the correct kind of feed, and the kind of care that will keep him in a strong, vigorous, healthy condition.

The bull shall not be permitted to run with the herd, shall not be allowed loose with any cow, and shall not serve over two cows in one day, nor more than seven in a week.

The herd where bull is kept must be free of tuberculosis and Bang's disease. All bulls must be purchased subject to the T. B. and Bang's tests.

The custodian in return for care and feed shall have free service for his herd. A service fee of $..... shall be charged to non-members of the association. No outside cows will be bred without permission of the board of directors.

The association bulls shall be inspected at least twice a year by a committee appointed by the directors, and a report made as to their health, condition, and breeding ability.

No bull can be sold or disposed of without the consent of the board of directors, advisory committee, club leader, and county agent.

In case any bull is not getting proper care or management, he shall be moved to a more desirable location by the board of directors.

A bull may be bought as a calf but shall not be used for service until he is one year old.

Every two years the bull in each block shall be shifted in the numerical order of the blocks, unless otherwise arranged. The directors shall arrange for the disposition of the bulls that have made a complete round of all the blocks.

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[1931—5 M; 1937—5 M; 1940—7500]

Gestation Table for Dairy Cows

Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve
Jan.	Oct.	Feb.	Nov.	Mar.	Dec.	Apr.	Jan.	May	Feb.	June	Mar.	July	Apr.	Aug.	May	Sept.	June	Oct.	July	Nov.	Aug.	Dec.	Sept.
1	10	1	10	1	8	1	8	1	7	1	10	1	9	1	10	1	10	1	10	1	10	1	9
2	11	2	11	2	9	2	9	2	8	2	11	2	10	2	11	2	11	2	11	2	11	2	10
3	12	3	12	3	10	3	10	3	9	3	12	3	11	3	12	3	12	3	12	3	12	3	11
4	13	4	13	4	11	4	11	4	10	4	13	4	12	4	13	4	13	4	13	4	13	4	12
5	14	5	14	5	12	5	12	5	11	5	14	5	13	5	14	5	14	5	14	5	14	5	13
6	15	6	15	6	13	6	13	6	12	6	15	6	14	6	15	6	15	6	15	6	15	6	14
7	16	7	16	7	14	7	14	7	13	7	16	7	15	7	16	7	16	7	16	7	16	7	15
8	17	8	17	8	15	8	15	8	14	8	17	8	16	8	17	8	17	8	17	8	17	8	16
9	18	9	18	9	16	9	16	9	15	9	18	9	17	9	18	9	18	9	18	9	18	9	17
10	19	10	19	10	17	10	17	10	16	10	19	10	18	10	19	10	19	10	19	10	19	10	18
11	20	11	20	11	18	11	18	11	17	11	20	11	19	11	20	11	20	11	20	11	20	11	19
12	21	12	21	12	19	12	19	12	18	12	21	12	20	12	21	12	21	12	21	12	21	12	20
13	22	13	22	13	20	13	20	13	19	13	22	13	21	13	22	13	22	13	22	13	22	13	21
14	23	14	23	14	21	14	21	14	20	14	23	14	22	14	23	14	23	14	23	14	23	14	22
15	24	15	24	15	22	15	22	15	21	15	24	15	23	15	24	15	24	15	24	15	24	15	23
16	25	16	25	16	23	16	23	16	22	16	25	16	24	16	25	16	25	16	25	16	25	16	24
17	26	17	26	17	24	17	24	17	23	17	26	17	25	17	26	17	26	17	26	17	26	17	25
18	27	18	27	18	25	18	25	18	24	18	27	18	26	18	27	18	27	18	27	18	27	18	26
19	28	19	28	19	26	19	26	19	25	19	28	19	27	19	28	19	28	19	28	19	28	19	27
20	29	20	29	20	27	20	27	20	26	20	29	20	28	20	29	20	29	20	29	20	29	20	28
21	30	21	30	21	28	21	28	21	27	21	30	21	29	21	30	21	30	21	30	21	30	21	29
22	31	Dec.		22	29	22	29	22	28	22	31	22	30	22	31	July		22	31	22	31	22	30
Nov.		22	1	23	30	23	30	Mar.		Apr.		May		June		22	1	Aug.		Sept.		Oct.	
23	1	23	2	24	31	24	31	23	1	23	1	23	1	23	1	23	2	23	1	23	1	23	1
24	2	24	3	Jan.		Feb.		24	2	24	2	24	2	24	2	24	3	24	2	24	2	24	2
25	3	25	4	25	1	25	1	25	3	25	3	25	3	25	3	25	4	25	3	25	3	25	3
26	4	26	5	26	2	26	2	26	4	26	4	26	4	26	4	26	5	26	4	26	4	26	4
27	5	27	6	27	3	27	3	27	5	27	5	27	5	27	5	27	6	27	5	27	5	27	5
28	6	28	7	28	4	28	4	28	6	28	6	28	6	28	6	28	7	28	6	28	6	28	6
29	7	29	8	29	5	29	5	29	7	29	7	29	7	29	7	29	8	29	7	29	7	29	7
30	8			30	6	30	6	30	8	30	8	30	8	30	8	30	9	30	8	30	8	30	8
31	9			31	7			31	9			31	9	31	9			31	9			31	9